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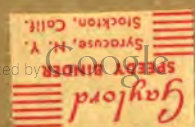
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SEVENTH ANNUAL REPORT

OF THE

RECLAMATION SERVICE

. 1907-1908

F. H. NEWELL, DIRECTOR



WASHINGTON
GOVERNMENT PRINTING OFFICE
1908

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LETTERS OF TRANSMITTAL

DEPARTMENT OF THE INTERIOR,
Washington, December 2, 1908.

SIR: The act of Congress approved June 17, 1902, entitled "An act appropriating the receipts from the sale and disposal of public lands in certain States and Territories to the construction of irrigation works for the reclamation of arid lands," provides (sec. 2) as follows:

That the Secretary of the Interior is hereby authorized and directed to make examinations and surveys for, and to locate and construct, as herein provided, irrigation works for the storage, diversion, and development of waters, including artesian wells, and to report to Congress at the beginning of each regular session as to the results of such examinations and surveys, giving estimates of cost of all contemplated works, the quantity and location of the lands which can be irrigated therefrom, and all facts relative to the practicability of each irrigation project; also the cost of works in process of construction, as well as of those which have been completed.

In compliance with the requirements of the statute, I have the honor to transmit herewith the report contemplated by the above-mentioned section of the act of June 17, 1902.

Very respectfully,

JAMES RUDOLPH GARFIELD,
Secretary.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEPARTMENT OF THE INTERIOR,
UNITED STATES RECLAMATION SERVICE,
Washington, D. C., November 25, 1908.

SIR: I have the honor to transmit herewith a report of the work done and in progress under the reclamation act approved by the President on June 17, 1902, together with other information essential to an understanding of the subject.

This report supplements the first, second, third, fourth, fifth, and sixth annual reports of the Reclamation Service already printed. It relates in particular to the operations during the fiscal year ended June 30, 1908, but in a few instances information of a later date has been inserted, particularly in connection with operations that are nearly completed. The report describes the progress that has been made on projects authorized for building. In the six years that have elapsed since the passage of the act, work has begun on most of the

large projects that are to be built in the near future, and extensive areas in various parts of the arid West have been brought under water.

In accordance with the terms of the reclamation act the money spent in constructing the works is commencing to return for use in other reclamation enterprises, and every precaution is being taken that this feature of the law shall be effectively administered.

Very respectfully,

F. H. NEWELL,
Director.

The SECRETARY OF THE INTERIOR.

SEVENTH ANNUAL REPORT

OF THE

RECLAMATION SERVICE

F. H. NEWELL, *Director*

GENERAL DISCUSSION

LEGISLATION

GENERAL STATEMENT

The reclamation act and acts of Congress affecting the operations thereunder have been printed in the fifth and sixth annual reports. For convenience of reference the reclamation act is here reprinted together with laws affecting operations thereunder that have not heretofore been printed in the annual reports.

RECLAMATION ACT

AN ACT Appropriating the receipts from the sale and disposal of public lands in certain States and Territories to the construction of irrigation works for the reclamation of arid lands.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That all moneys received from the sale and disposal of public lands in Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington, and Wyoming, beginning with the fiscal year ending June thirtieth, nineteen hundred and one, including the surplus of fees and commissions in excess of allowances to registers and receivers, and excepting the five per centum of the proceeds of the sales of public lands in the above States set aside by law for educational and other purposes, shall be, and the same are hereby, reserved, set aside, and appropriated as a special fund in the Treasury to be known as the "reclamation fund," to be used in the examination and survey for and the construction and maintenance of irrigation works for the storage, diversion, and development of waters for the reclamation of arid and semiarid lands in the said States and Territories, and for the payment of all other expenditures provided for in this act: *Provided,* That in case the receipts from the sale and disposal of public lands other than those realized from the sale and disposal of lands referred to in this section are insufficient to meet the requirements for the support of agricultural colleges in the several States and Territories, under the act of August thirtieth, eighteen hundred and ninety, entitled "An act to apply a portion of the proceeds of the public lands to the more complete endowment and support of the colleges

for the benefit of agriculture and the mechanic arts, established under the provisions of an act of Congress approved July second, eighteen hundred and sixty-two," the deficiency, if any, in the sum necessary for the support of the said colleges shall be provided for from any moneys in the Treasury not otherwise appropriated.

SEC. 2. That the Secretary of the Interior is hereby authorized and directed to make examinations and surveys for, and to locate and construct, as herein provided, irrigation works for the storage, diversion, and development of waters, including artesian wells, and to report to Congress at the beginning of each regular session as to the results of such examinations and surveys, giving estimates of cost of all contemplated works, the quantity and location of the lands which can be irrigated therefrom, and all facts relative to the practicability of each irrigation project; also the cost of works in process of construction, as well as of those which have been completed.

SEC. 3. That the Secretary of the Interior shall, before giving the public notice provided for in section four of this act, withdraw from public entry the lands required for any irrigation works contemplated under the provisions of this act, and shall restore to public entry any of the lands so withdrawn when, in his judgment, such lands are not required for the purposes of this act; and the Secretary of the Interior is hereby authorized, at or immediately prior to the time of beginning the surveys for any contemplated irrigation works, to withdraw from entry, except under the homestead laws, any public lands believed to be susceptible of irrigation from said works: *Provided*, That all lands entered and entries made under the homestead laws within areas so withdrawn during such withdrawal shall be subject to all the provisions, limitations, charges, terms, and conditions of this act; that said surveys shall be prosecuted diligently to completion, and upon the completion thereof, and of the necessary maps, plans, and estimates of cost, the Secretary of the Interior shall determine whether or not said project is practicable and advisable, and if determined to be impracticable or unadvisable he shall thereupon restore said lands to entry; that public lands which it is proposed to irrigate by means of any contemplated works shall be subject to entry only under the provisions of the homestead laws in tracts of not less than forty nor more than one hundred and sixty acres, and shall be subject to the limitations, charges, terms, and conditions herein provided: *Provided*, That the commutation provisions of the homestead laws shall not apply to entries made under this act.

SEC. 4. That upon the determination by the Secretary of the Interior that any irrigation project is practicable, he may cause to be let contracts for the construction of the same, in such portions or sections as it may be practicable to construct and complete as parts of the whole project, providing the necessary funds for such portions or sections are available in the reclamation fund, and thereupon he shall give public notice of the lands irrigable under such project, and limit of area per entry, which limit shall represent the acreage which, in the opinion of the Secretary, may be reasonably required for the support of a family upon the lands in question; also of the charges which shall be made per acre upon the said entries, and upon the lands in private ownership which may be irrigated by the waters of the said irrigation project, and the number of annual installments, not exceeding ten, in which such charges shall be paid and the time when such payments shall commence. The said charges shall be determined with a view of returning to the reclamation fund the estimated cost of construction of the project, and shall be apportioned equitably: *Provided*, That in all construction work eight hours shall constitute a day's work, and no Mongolian labor shall be employed thereon.

SEC. 5. That the entryman upon lands to be irrigated by such works shall, in addition to compliance with the homestead laws, reclaim at least one-half of the total irrigable area of his entry for agricultural purposes, and before receiving patent for the lands covered by his entry shall pay to the Government the charges apportioned against such tract, as provided in section four. No right to the use of water for land in private ownership shall be sold for a tract exceeding one hundred and sixty acres to any one landowner, and no such sale shall be made to any landowner unless he be an actual bona fide resident on such land, or occupant thereof residing in the neighborhood of said land, and no such right shall permanently attach until all payments therefor are made. The annual installments shall be paid to the receiver of the local land office of the district in which the land is situated, and a failure to make any two payments when due shall render the entry subject to cancellation, with the forfeiture of all rights under this act, as well as of any moneys already

paid thereon. All moneys received from the above sources shall be paid into the reclamation fund. Registers and receivers shall be allowed the usual commissions on all moneys paid for lands entered under this act.

SEC. 6. That the Secretary of the Interior is hereby authorized and directed to use the reclamation fund for the operation and maintenance of all reservoirs and irrigation works constructed under the provisions of this act: *Provided*, That when the payments required by this act are made for the major portion of the lands irrigated from the waters of any of the works herein provided for, then the management and operation of such irrigation works shall pass to the owners of the lands irrigated thereby, to be maintained at their expense under such form of organization and under such rules and regulations as may be acceptable to the Secretary of the Interior: *Provided*, That the title to and the management and operation of the reservoirs and the works necessary for their protection and operation shall remain in the Government until otherwise provided by Congress.

SEC. 7. That where in carrying out the provisions of this act it becomes necessary to acquire any rights or property, the Secretary of the Interior is hereby authorized to acquire the same for the United States by purchase or by condemnation under judicial process, and to pay from the reclamation fund the sums which may be needed for that purpose, and it shall be the duty of the Attorney-General of the United States upon every application of the Secretary of the Interior, under this act, to cause proceedings to be commenced for condemnation within thirty days from the receipt of the application at the Department of Justice.

SEC. 8. That nothing in this act shall be construed as affecting or intended to affect or to in any way interfere with the laws of any State or Territory relating to the control, appropriation, use, or distribution of water used in irrigation, or any vested right acquired thereunder, and the Secretary of the Interior, in carrying out the provisions of this act, shall proceed in conformity with such laws, and nothing herein shall in any way affect any right of any State or of the Federal Government or of any landowner, appropriator, or user of water in, to, or from any interstate stream or the waters thereof: *Provided*, That the right to the use of water acquired under the provisions of this act shall be appurtenant to the land irrigated, and beneficial use shall be the basis, the measure, and the limit of the right.

SEC. 9. That it is hereby declared to be the duty of the Secretary of the Interior in carrying out the provisions of this act, so far as the same may be practicable and subject to the existence of feasible irrigation projects, to expend the major portion of the funds arising from the sale of public lands within each State and Territory, hereinbefore named for the benefit of arid and semiarid lands within the limits of such State or Territory: *Provided*, That the Secretary may temporarily use such portion of said funds for the benefit of arid or semiarid lands in any particular State or Territory hereinbefore named as he may deem advisable, but when so used the excess shall be restored to the fund as soon as practicable, to the end that ultimately, and in any event, within each ten-year period after the passage of this act, the expenditures for the benefit of the said States and Territories shall be equalized according to the proportions and subject to the conditions as to practicability and feasibility aforesaid.

SEC. 10. That the Secretary of the Interior is hereby authorized to perform any and all acts and to make such rules and regulations as may be necessary and proper for the purpose of carrying the provisions of this act into full force and effect (32 Stat. L., 388).

Approved, June 17, 1902.

IRRIGATION OF INDIAN LANDS

The act of Congress approved April 30, 1908 (35 Stat. L., 70), entitled "An act making appropriations for the current and contingent expenses of the Indian department, for fulfilling treaty stipulations with various Indian tribes and for other purposes for the fiscal year ending June 30, 1909," contains the following provision:

That in carrying out any irrigation project which may be undertaken under the provisions of the act of June seventeenth, nineteen hundred and two (Thirty-second Statutes, page three hundred and eighty-eight), known as the reclamation act, and which may make possible, and provide for, in connection

with the reclamation of other lands, the irrigation of all or any part of the irrigable lands heretofore included in allotments made to Indians under the fourth section of the general allotment act, the Secretary of the Interior be and he hereby is, authorized to make such arrangement and agreement in reference thereto as said Secretary deems for the best interest of the Indians. *Provided*, That no lien or charge for construction, operation, or maintenance shall thereby be created against any such reserved lands: *And provided further* That to meet the necessary cost of carrying out this legislation the Secretary of the Interior is authorized to expend, out of the sum appropriated in this act for irrigation, an amount not exceeding thirteen thousand dollars. (33 Stat. L., 85.)

COLVILLE RESERVATION

Section 12 of the act of Congress approved March 22, 1906, entitled "An act to authorize the sale and disposition of surplus or unallotted lands of the diminished Colville Indian Reservation, in the State of Washington, and for other purposes," reads as follows:

That if any of the lands of said diminished Colville Indian Reservation can be included in any feasible irrigation project under the reclamation act of June seventeenth, nineteen hundred and two, the Secretary of the Interior is authorized to withhold said lands from disposition under this act and to dispose of them under the said reclamation act, and the charges provided for by said reclamation act shall be in addition to the appraised value of said lands fixed as hereinbefore provided and shall be paid in annual installments as required under the said reclamation act, and the amounts to be paid for the land, according to appraisal, shall be credited to the fund herein established for the benefit of the Colville Indians. (34 Stat. L., 80.)

FORT PECK RESERVATION

By section 1 of the act of Congress approved May 30, 1908, entitled "An act for the survey and allotment of lands now embraced within the limits of the Fort Peck Indian Reservation in the State of Montana and the sale and disposition of all the surplus lands after allotment," the Secretary of the Interior is authorized and directed to cause an examination to be made of the lands within the reservation by the Reclamation Service, and, if there are found any lands that it may be deemed practicable to bring under an irrigation project, he is authorized to construct such project and reserve such lands as may be irrigable therefrom or necessary for irrigation works and also such coal lands as may be necessary in the construction and maintenance of any such projects. Section 10 of this act provides as follows:

That if, after the approval of the classification and appraisal, as provided herein, there shall be found lands within the limits of the reservation deemed practicable for irrigation projects deemed practicable under the provisions of the act of Congress approved June seventeenth, nineteen hundred and two, known as the reclamation act, said lands shall be subject to withdrawal and be disposed of under the provisions of said act, and settlers shall pay, in addition to the cost of construction and maintenance provided therein, the appraised value as provided in this act, to the proper officers, to be covered into the Treasury of the United States to the credit of the Indians. (35 Stat. L., 562.)

ASSIGNMENTS OF PAY

The act of Congress approved May 27, 1908 (35 Stat. L., 317), entitled "An act making appropriations for sundry civil expenses of the Government for the fiscal year ending June 30, 1909, and for other purposes," contains the following provision:

The Secretary of the Interior is hereby authorized to permit the employees of the Reclamation Service, while employed in the field, to make assignments of their pay under such regulations as he may prescribe. (35 Stat. L., 350.)

COMPENSATION FOR INJURED EMPLOYEES

Sections 1 and 2 of the act of Congress approved May 30, 1908, entitled: "An act granting to certain employees of the United States the right to receive from it compensation for injuries sustained in the course of their employment," read as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That when, on or after August first, nineteen hundred and eight, any person employed by the United States as an artisan or laborer in any of its manufacturing establishments, arsenals, or navy-yards, or in the construction of river and harbor or fortification work, or in hazardous employment on construction work in the reclamation of arid lands or the management and control of the same, or in hazardous employment under the Isthmian Canal Commission, is injured in the course of such employment, such employee shall be entitled to receive for one year thereafter, unless such employee, in the opinion of the Secretary of Commerce and Labor, be sooner able to resume work, the same pay as if he continued to be employed, such payment to be made under such regulations as the Secretary of Commerce and Labor may prescribe: *Provided*, That no compensation shall be paid under this act where the injury is due to the negligence or misconduct of the employee injured, nor unless said injury shall continue for more than fifteen days. All questions of negligence or misconduct shall be determined by the Secretary of Commerce and Labor.

SEC. 2. That if any artisan or laborer so employed shall die during the said year by reason of such injury received in the course of such employment, leaving a widow, or a child or children under sixteen years of age, or a dependent parent, such widow and child or children and dependent parent shall be entitled to receive, in such portions and under such regulations as the Secretary of Commerce and Labor may prescribe, the same amount, for the remainder of the said year, that said artisan or laborer would be entitled to receive as pay if such employee were alive and continued to be employed: *Provided*, That if the widow shall die at any time during the said year her portion of said amount shall be added to the amount to be paid to the remaining beneficiaries under the provisions of this section, if there be any. (35 Stat. L., 556.)

The act also contains the necessary provisions for carrying out its terms, and appropriate blanks upon which reports are to be made have been received from the Department of Commerce and Labor and distributed to the various offices of this service.

DECISIONS OF THE SECRETARY OF THE INTERIOR

GENERAL STATEMENT

Below is given, under suitable headings, a digest of the decisions that have been rendered by the Secretary of the Interior and of some decisions rendered by the Comptroller of the Treasury during the past year relating to operations under the reclamation act.

RECLAMATION FUND

Proceeds of rentals of Indian lands are properly repayments to the appropriation, notwithstanding there is a liability for the use thereof to the Indians. (November 9, 1907; 14 Compt., 285.)

The reclamation fund is a special fund, but it is not a trust fund. (December 14, 1907; 14 Compt., 361.)

Under the authority contained in section 10 of the reclamation act the Secretary of the Interior may employ trained secretaries of the Young Men's Christian Association to improve the conditions in construction camps and to look after the sanitary and related matters

as incidental to the employment and as a part of the compensation of said employees and payment therefor may be made from the reclamation fund. (April 9, 1908; 14 Compt., 672.)

PURCHASE OF LANDS

Under the provisions of the act of June 21, 1906 (34 Stat. L., 325), authorizing the sale of allotted Indian lands within reclamation projects during the trust period, a contract by an Indian allottee to convey to the United States a strip over his allotted lands as a right of way for a canal under a reclamation project executed during such period may properly be approved by the Secretary of the Interior. (October 25, 1907; 36 L. D., 135.)

Where the United States is in possession of land under a lease and at the expiration thereof purchases the land and a deed is executed to the United States therefor, the relation of the parties is thereupon changed from that of landlord and tenant to that of vendor and vendee and no implied contract to pay rent for use and occupancy of the land during the time between the execution of the deed and the final consummation of the purchase by payment of the purchase money can arise. (November 20, 1907; 14 Compt., 312.)

DEFAULTING CONTRACTORS

In case of default by a contractor any retained percentage becomes the property of the United States. Such forfeiture is a penalty and so much of the money as may be necessary to compensate the United States for the damages suffered by reason of default, including delay in completion of the work, may be deducted therefrom. (October 10, 1907; 14 Compt., 203.)

Where under the terms of the contract the Government upon default of the contractor annulled the contract and entered into an agreement with another contractor for the completion of the work called for by the annulled contract, the 10 per cent reserved under the terms of the annulled contract from payments to the defaulting contractor to secure completion of the work can not be paid to said defaulting contractor until the work provided for in his contract has been completed or stopped by the Government. (February 10, 1908; 14 Compt., 496.) But when the contract becomes impossible of fulfillment without default of either party the retained percentage may be paid. (April 11, 1908; 14 Compt., 677.)

ENTRIES AND SELECTIONS

An application to purchase lands under the timber and stone act prior to making final proof and payment will not prevent withdrawal thereafter under the provisions of the reclamation act. (July 16, 1907; 36 L. D., 18.)

An entry of lands subject to the provisions of the reclamation act will not be allowed as additional to a prior entry subject only to the provisions of the general homestead law. (May 29, 1908; 26 L. D., 449.)

RIGHTS OF WAY

Under the provision of the act of August 30, 1890 (26 Stat. L., 391), directing a reservation in all patents for lands west of the 100th meridian for a right of way thereon for ditches or canals constructed by the United States, the Government has full authority to construct canals or ditches over any such lands in connection with reclamation projects. (June 6, 1908; 36 L. D., 482.)

The grant of a right of way to a railroad company under the act of March 3, 1895, after the passage of the act of August 30, 1890, is burdened with a reservation for right of way for canals and ditches, and this right of way may be utilized by the Government without compensation except for actual loss or damages. (June 6, 1908; 36 L. D., 482.)

WATER USERS' ASSOCIATIONS

Below are given the designations and addresses of the water users' associations that have been organized for cooperation with the United States under the provisions of the act of Congress approved June 17, 1902 (32 Stat. L. 388).

Belle Fourche Valley, Belle Fourche, S. Dak.
 Buford-Trenton, Buford, N. Dak.
 Elephant Butte, Las Cruces, N. Mex.
 El Paso Valley, El Paso, Tex.
 Finney County, Garden City, Kans.
 Klamath, Klamath Falls, Oreg.
 Lower Milk River Valley, Malta, Mont.
 Lower Yellowstone, Sidney, Mont.
 North Platte Valley, Scotts Bluff, Nebr.
 Okanogan, Alma, Wash.
 Orland, Orland, Cal.
 Payette-Boise, Caldwell, Idaho.
 Pecos, Carlsbad, N. Mex.
 Rio Hondo, Roswell, N. Mex.
 Salt River Valley, Phoenix, Ariz.
 South Side Minidoka, Minidoka, Idaho.
 Strawberry Valley, Spanish Fork, Utah.
 Sun River, Great Falls, Mont.
 Sunnyside, North Yakima, Wash.
 Tieton, North Yakima, Wash.
 Umatilla, Hermiston, Oreg.
 Uncompahgre, Montrose, Colo.
 Williston, Williston, N. Dak.
 Yuma County, Yuma, Ariz.

LITIGATION

ARIZONA

Salt River project.—No further action has been reported in the case of *Hurley v. Abbott et al.*, referred to on page 9 of the sixth annual report, this being a suit for the purpose of determining individual water rights of landowners in the Salt River Valley who claim by virtue of appropriation the right to use for irrigation the natural flow of Salt River.

Yuma project.—There have been no further developments in the case of the Irrigation Land and Improvement Company, referred to

on page 10 of the sixth annual report. The case is pending before the United States Supreme Court.

COLORADO

Uncompahgre Valley project.—The suit of the Denver Saving Bank to secure possession of property mortgaged to the bank by the Taylor-Moore Construction Company, defaulting contractors for the construction of the Gunnison tunnel, referred to on page 10 of the sixth annual report, is still pending on appeal to the United States circuit court.

IDAHO

Payette-Boise project.—In connection with the injunction proceedings instituted by Mrs. Kate Green, referred to on page 30 of the sixth annual report, a stipulation was entered into on November 2, 1907, between the plaintiff and the United States, whereby Mrs. Green agreed to permit the United States to continue construction of canals across her lands upon condition that in case final termination of the litigation is adverse to the United States, the Reclamation Service shall pay to her the sum of \$1,000 for the lands required, upon delivery of warranty deeds conveying clear title to the United States. On February 7, 1908, the Idaho supreme court decided that the act of August 30, 1890 (26 Stat. L., 391) reserves to the United States rights of way across the land in question.

A number of suits have been instituted for the acquisition of land within the Deer Flat reservoir where it was found impossible to acquire them by agreement.

NEBRASKA-WYOMING

North Platte project.—No further proceedings have been had in the Leavitt suit, referred to on page 10 of the sixth annual report.

The suit for condemnation of land of Richard Whalen, referred to on page 11 of the sixth annual report, has been tried in the United States district court and judgment rendered, the United States securing title to the land desired.

NEVADA

Truckee-Carson project.—A hearing has been had in the suit of the United States *v.* Rickey Land and Cattle Company, referred to on page 11 of the sixth annual report, in which it was sought to restrain this company from utilizing the Alkali reservoir site and on June 26 an injunction pendente lite was granted, the defendants being given until August 24, 1908, to answer.

NEW MEXICO

Carlsbad project.—The first attempt to determine the rights to the use of the waters of Black River was by suit brought in the Territorial court by D. R. Harkey and C. R. Brice *v.* Edward F. Judkins with the United States as intervenor. This has been dismissed and complaint filed in the federal court under the title of United States *v.* Judkins et al., asking for a complete adjudication of the water rights, the Government claiming, as the successor of the Pecos Irrigation Company, prior right to the use of the waters of that stream. All

the defendants filed answers promptly except Judkins, who filed a motion to require the complaint to be made more definite and certain. The motion was overruled and ten days given to answer. The answer has been filed and it is expected that the case will be tried at the next term of court at Roswell, N. Mex.

The United States has also brought suit in connection with the water rights for this project in the Territorial court against the Penasco Reservoir and Development Company et al., seeking to enjoin the company from diverting the waters of the Rio Penasco in contravention of the priorities possessed by the United States. On July 20, 1908, a motion was made for an injunction; this was refused but an order was issued requiring the defendants to show cause why the injunction should not issue. In the meantime, the floods in the Penasco washed out the company's works and on July 29 the court issued an injunction restraining the defendants from placing any obstruction in the channel of the Penasco or Walnut Creek or further interfering in any way with the flow of said streams until further order of the court. Final decree was subsequently entered making the injunction permanent in a modified form, permitting construction in such manner and under such restrictions as to fully protect the interests of the United States.

Hondo project.—In the suit of the United States *v.* Lillie C. Klasner, referred to on page 12 of the sixth annual report, seeking to restrain the defendant from unlawfully diverting the waters of the Hondo River to the prejudice of the interests of the United States, the case has been continued from time to time and it is expected that it will be finally disposed of during the fall term of court.

SOUTH DAKOTA

Belle Fourche project.—On September 10, 1907, complaint was made before the United States grand jury relative to possession of one horse that had been stolen from the government pasture and sold in Deadwood. After a true bill had been found by the grand jury the horse was returned and the case dropped.

On October 19, 1907, the sheriff of Butte County levied on two teams of horses and harness that formerly belonged to the Widell-Finley Company, for taxes for the year 1906. As the equipment and plant had been in possession of the United States during this time and not subject to taxation, complaint was filed in the United States court, and on the 26th day of October the horses and harness were returned to the Government by order of the court. Final hearing in the action has not yet been had.

During May, 1908, suit was brought against William Cassavant and wife to obtain possession of certain buildings constructed by Orman and Crook on land controlled by the defendants. The buildings were afterwards turned over to the bondsmen of Orman and Crook, as their successors, who are completing the contract.

WASHINGTON

Yakima project.—The suit brought by the United States against Christian Hanson, referred to on page 12 of the sixth annual report, for the acquisition of certain lands required for this project is pending on appeal by the United States before the United States circuit

court of appeals at San Francisco, Cal. It is expected that the case will come up for trial during the coming winter.

WYOMING

Shoshone project.—In November, 1907, suit was brought in the United States district court against the United States marshal to secure possession of certain materials that had been purchased by Charles Spear, defaulting contractor, for the construction of the Corbett tunnel, and subsequently attached by the marshal. Judgment was found for the United States.

PURCHASES OF RIGHTS AND PROPERTY

Section 7 of the reclamation act provides that where in carrying out the provisions of the act it is necessary to acquire any rights or property the Secretary of the Interior may acquire them for the United States by purchase or by condemnation through judicial process.

The following is a complete list of all such completed purchases to June 30, 1908, except as heretofore reported in the fourth, fifth, and sixth annual reports:

SALT RIVER PROJECT, ARIZONA

Vendor.	Description.	Consideration.	Date of deed
Alkire Land and Cattle Co...	10.320 acres for rancho station in sec. 28, T. 2 N., R. 2 E., G. and S. R. M.	\$1.00	June 1, 1908
Do.....	Strip 17 feet wide north side grand canal in SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 28, T. 2 N., R. 2 E.	1.00	Dec. 7, 1908
Bartlett, Adolphus, and wife.	Strip of land on north side of grand canal in sec. 26, T. 2 N., R. 2 E., G. and S. R. M.	1.00	Apr. 8, 1908
Beck, Ira.....	Strip of land 17 feet wide north side grand canal in sec. 27, T. 2 N., R. 2 E.	1.00	Dec. 7, 1908
Fillsworth, Ernest, and wife..	S. $\frac{1}{4}$ lots 3 and 4 in block 21, city of Mesa, Ariz., except the S. 30 feet of said lots.	1,000.00	Jan. 13, 1908
Evans, Edith.....	Strip of land 17 feet wide north side grand canal in NW. $\frac{1}{4}$ NW. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 25, T. 2 N., R. 2 E., G. and S. R. M.	1.00	Jan. 14, 1908
Gillett, G. M., and Raymond H. Satterwhite and wife.	Strip of land 76 feet wide extending across the NW. $\frac{1}{4}$ sec. 25, T. 2 N., R. 2 E., G. and S. R. M. from the east line of said NW. $\frac{1}{4}$ to the west line thereof.	1.00	Feb. 13, 1908
Hedgpeth, L. J., and wife....	Strip of land 17 feet wide on north side of grand canal in sec. 20, T. 2 N., R. 3 E., G. and S. R. M.; also a strip comprising 0.632 acre adjacent to said parcel.	1.00	Dec. 3, 1908
Mognett, F. M., and wife.....	A strip of land across sec. 19, T. 2 N., R. 3 E., G. and S. R. M.	1.00	Dec. 26, 1908
Renaud, H., and wife.....	Strip of land across south side of lot 24, block 14, and lot 25, block 14, village of Alhambra, Ariz., on north side of grand canal.	1.00	Mar. 16, 1908
Reaksecker, B. F., and wife..	A strip of land on south side of grand canal across block 16, town of Alhambra, in sec. 26, T. 2 N., R. 2 E.	1.00	Do.
Sergeant, John W.....	Strip of land across the south side of lot 6, block 17, of Alhambra, Ariz., along the north side of the grand canal.	1.00	Mar. 3, 1908
Sergeant, M. E.....	Strip of land 17 feet wide along the north side of the grand canal, in sec. 26, T. 2 N., R. 2 E., G. and S. R. M.	1.00	Dec. 27, 1907
M. H. Sherman Investment Co.	A strip of land 17 feet wide along the north side of the grand canal, in sec. 21, T. 2 N., R. 3 E., G. and S. R. M.	1.00	Nov. 27, 1907
Valley Bank, of Phoenix, Ariz.	A strip of land 17 feet wide across sec. 19, T. 2 N., R. 2 E., G. and S. R. M., along the grand canal.	1.00	Dec. 26, 1908

YUMA PROJECT, ARIZONA—CALIFORNIA

Vendor.	Description.	Consideration.	Date of deed.
Breedlove, R. D., and wife...	Part of SW. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 8, T. 9 S., R. 24 W., G. and S. R. M., 2 acres.	\$20.00	Oct. 22, 1907
Colby, R. V., and husband...	Strip of land across lots 12 and 13 of sec. 23, and S. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 24, T. 8 S., R. 22 W., G. and S. R. M., Yuma County, Ariz.	160.00	June 22, 1907
Colorado Valley Pumping and Irrigating Co.	Canal system near Yuma, Ariz.	6,000.00	Mar. 15, 1907
Cunningham, Samuel D., and wife.	Part of NE. $\frac{1}{4}$ NE. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 33, T. 16 S., R. 22 E.	1.00	Feb. 6, 1908
Yuma Valley Union Land and Water Co. and F. L. Ingraham, assignee.	Canal system in Yuma County, Ariz., in secs. 28, 32, and 33, T. 16 S., R. 22 E., S. B. M.; secs. 24, 25, 26, 35, 36, T. 8 S., R. 24 W., secs. 1, 2, 11, 12, 14, 15, 22, 23, 26, 27, 34, and 35, T. 9 S., R. 24 W., secs. 2, 3, 11, and 14, T. 10 S., R. 24 W., secs. 6, 7, 18, 19, T. 9 S., R. 23 W., G. and S. R. M., together with all laterals and sublaterals, flumes, headgates, sluiceways, pipes, conduits, reservoirs, rights of way, etc.	17,000.00	Feb. 3, 1908

ORLAND PROJECT, CALIFORNIA

Crosset, David, and wife.....	SE. $\frac{1}{4}$ sec. 2, sec. 11, N. $\frac{1}{4}$ NE. $\frac{1}{4}$ and NW. $\frac{1}{4}$ sec. 14, T. 17 N., R. 6 E., M. D. M., 1,040 acres.	\$16,500.00	June 22, 1908
Harbison, Alfred K.....	Lots 1, 8, 9, and 16, T. 18 N., R. 6 W., M. D. M..	1,000.00	.....
Morrissey, W. H., and wife..	Part of Orland Orange Park No. 2, 10 acres....	375.00	June 12, 1908

UNCOMPAHGRE VALLEY PROJECT, COLORADO

Montrose and Delta Canal Co.	Irrigation system in T. 48 N., Rs. 9 and 10 W., T. 49 N., Rs. 9 and 10 W., T. 50 N., Rs. 10 and 11 W., T. 51 N., R. 11 W.	\$111,000.00	May 4, 1908
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MINIDOKA PROJECT, IDAHO

Goyn, Charles A.....	W. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 10, T. 9 S., R. 23 E., B. M..	\$180.00	Aug. 1, 1907
Hansen, James.....	Damages to improvements on lots 5, 6, and 7, sec. 15, T. 9 S., R. 29 E., B. M..	250.00	Aug. 6, 1907
Sheffield, Benjamin D. and wife, and Marion L. J. Lambert and wife.	Lots 4 and 5, sec. 18, T. 45 N., R. 114 W., 6th P. M., 66.74 acres.	2,300.00	Apr. 27, 1907
Sweetser, Lewis H., and wife	Part of W. $\frac{1}{4}$ SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ and SW. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 25, T. 9 S., R. 27 E., B. M., 123 acres.	3,320.00	Aug. 26, 1907
Whittle, Ed.....	Damages to improvements on lots 5, 6, and 7, sec. 15, T. 9 S., R. 29 E., B. M..	250.00	Mar. 13, 1907

PAYETTE-BOISE PROJECT, IDAHO

Aven, Horace B., and wife...	SE. $\frac{1}{4}$ sec. 35, T. 3 N., R. 3 W., 160 acres, B. M..	\$10,000.00	Sept. 3, 1907
Moberly, Jordan H., and wife.	NW. $\frac{1}{4}$ sec. 20, T. 3 N., R. 3 W., B. M., 160 acres.	2,400.00	Dec. 4, 1907
School District No. 17.....	SE. cor. W. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 1, T. 2 N., R. 3 W., B. M., 2 acres.	1,050.00	May 28, 1908
Wilson, Silas and Edna.....	N. $\frac{1}{4}$ sec. 25, T. 3 N., R. 3 W., B. M., Canyon County, Idaho.	6,400.00	June 24, 1908

GARDEN CITY PROJECT, KANSAS

Finney County Farmers Irrigation Association.	Part of sec. 7, T. 24 S., R. 34 W., 6th P. M., 27.06 acres. Also rights of way across sections 11, 13, 23, and 12, T. 24 S., R. 34 W.	\$528.50	Oct. 17, 1907
Holcomb, Darius C., and wife.	Part of NW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 24, T. 24 S., R. 35 W., 6th P. M., 6.83 acres.	170.75	May 18, 1907

HUNTLEY PROJECT, MONTANA

Vendor.	Description.	Consideration.	Date of deed.
Chicago, Burlington and Quincy R. R. Co.	125.82 acres, part of E. $\frac{1}{2}$ sec. 25, T. 2 N., R. 27 E., M. P. M.	\$1.00	Jan. 30, 1908

MILK RIVER PROJECT, MONTANA

Blackfeet Indian Tribe.....	Canal right of way over Blackfeet Reservation, 27 miles, 982 acres.	\$3,953.75	-----
Henkel, Caroline, et al.....	Improvements and rights on 800 acres of land in Blackfeet Reservation.	7,600.00	Feb. 15, 1907
Housman, James H., et al....	Improvements and rights on 320 acres of land in Blackfeet Reservation.	1,000.00	Do.
Norris, Rachel.....	Improvements and rights on 280 acres of land in Blackfeet Reservation.	1,000.00	Do.

SUN RIVER PROJECT, MONTANA

Helkes, Parker.....	Damages to improvements on NW. $\frac{1}{4}$, and SW. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 9, T. 20 N., R. 3 W., M. P. M.	\$125.00	Feb. 29, 1908
Loomis, Lemuel.....	Part of sec. 1, T. 20 N., R. 4 W. and part of sec. 6, T. 20 N., R. 3 W., M. P. M., 12.59 acres.	1,861.50	Dec. 23, 1907
McKelvey, Chas. F., and wife.....	Part of SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 2, T. 20 N., R. 4 W., M. P. M., 4.27 acres.	149.45	Apr. 8, 1908
Sequist, Thore.....	Damages to improvements on SW. $\frac{1}{4}$ NE. $\frac{1}{4}$, W. $\frac{1}{4}$ SE. $\frac{1}{4}$, E. $\frac{1}{4}$ SW. $\frac{1}{4}$, and SE. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 15, T. 20 N., R. 3 W., M. P. M.	213.80	Feb. 29, 1908

LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA

Buckley, Frank L., and wife.	Part of NE. $\frac{1}{4}$ sec. 27, T. 23 N., R. 59 E., M. P. M., 6 acres.	\$60.00	Apr. 11, 1908
Chestnut, Lida H.....	Part of W. $\frac{1}{2}$ W. $\frac{1}{2}$ sec. 18, T. 22 N., R. 59 E., M. P. M., 1 acre.	10.00	Mar. 4, 1908
Chestnut, Thos. J., and wife.	Parts of SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 13, T. 22 N., R. 58 E. and of SW. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 18, T. 18 N., R. 59 E., M. P. M., 2.84 acres.	28.40	Do.
Josephsen, Louls, and wife...	Part of NW. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 15, T. 23 N., R. 59 E., M. P. M., 3 acres.	60.00	June 6, 1908
Lovering, Geo. I.....	Part NW. $\frac{1}{4}$ sec. 1, T. 21 N., R. 58 E., M. P. M., 3.5 acres.	35.00	June 20, 1908
McRae, Geo. L.....	Part sec. 11, T. 21 N., R. 58 E., M. P. M., 4.55 acres.	45.50	June 24, 1908
Meadors, John P., and wife ..	Part of SW. $\frac{1}{4}$ sec. 1, T. 21 N., R. 58 E., M. P. M., 4 $\frac{1}{2}$ acres.	45.00	Apr. 3, 1908
Montana (State of).....	Lots 1, 4, 5, 6, 7 and 8, $\frac{1}{2}$ S. $\frac{1}{2}$ sec. 36, T. 18 N., R. 56 E., 369.77 acres.	\$,697.70	Apr. 17, 1908
Do.....	Lands in secs. 16 and 36, Ts. 18 N., R. 57 E., 20, 21, and 22 N., 58 E., 23 and 24 N., 59 E., and 25 N., 60 E.	1.00	-----
Nelson, Nels Henry, and wife.	Part of sec. 35, T. 19 N., R. 57 E., M. P. M., $\frac{1}{2}$ acre.	100.00	Apr. 11, 1908
North Dakota (State of).....	Lands in sec. 16, T. 15 N., R. 104 W., 6th P. M.	1.00	-----
Northwestern Improvement Co.	Lands in Ts. 18 N., Rs. 56 and 57 E., 19 N., 57 and 58 E., 20, 21, and 22 N., 58 E., 23 N., R. 59 E., and 25 N., R. 60 E., M. P. M.	1.00	June 17, 1908
Staffenson, Ephraim and wife.	Parts of sec. 5, T. 22 N., R. 59 E., M. P. M., 2.34 acres.	70.20	June 6, 1908
Temple, Arthur A.....	Lots 1, 2, 3, 4 and 6, sec. 2, T. 17 N., R. 56 E., M. P. M.	1,500.00	Jan. 28, 1908

NORTH PLATTE PROJECT, NEBRASKA-WYOMING

Hiersche, Wenzel, and Anton.	Part of NE. $\frac{1}{4}$ sec. 1, T. 23 N., R. 55 W., 6th P. M.	\$1.00	May 9, 1908
Lincoln Land Co.....	Lot 3, block 2 of the original town of Mitchell, Nebr.	250.00	Feb. 1, 1908
Whalon, Richard.....	Lots 5 and 6 in sec. 2 and N. $\frac{1}{2}$ SE. $\frac{1}{4}$ and lots 7 and 8 sec. 3, T. 26 N., R. 65 W., 240 acres.	7,750.00	Nov. 27, 1907
Will, George B. M., and wife.	Part of sec. 30, T. 24 N., R. 56 W., 6th P. M....	1.00	Feb. 15, 1908

TRUCKEE-CARSON PROJECT, NEVADA.

Vendor.	Description.	Consideration.	Date of deed.
Allen, Lemuel, Cranston, and Sarah.	Canal rights of way	\$1.00	July 6, 1906
Bailey, J. A.	do.	1.00	July 11, 1906
Bassett, Elmer E.	do.	1.00	Jan. 30, 1908
Bechley, Calvin M., and Geo. Ernst.	do.	1.00	Mar. 12, 1907
Brown, Barbara.	do.	1.00	July 14, 1906
Brown, Willis H.	do.	1.00	Do.
Coniff, John C.	do.	1.00	Dec. 5, 1907
Cushman, C. O.	do.	1.00	July 16, 1906
Cushman, J. J., and Lizzie.	do.	1.00	Do.
Cushman, R. D.	do.	1.00	May 2, 1907
Danielson, Jas. W., and John E.	do.	1.00	Aug. 22, 1907
Dempsey, Geo. L., and Jessie R.	do.	1.00	Jan. 17, 1907
Denning, C. E.	do.	1.00	July 18, 1906
Dolf, Thos.	do.	1.00	July 3, 1906
Dolf, Thomas, and wife.	Part of NE. $\frac{1}{4}$ sec. 11, T. 18 N., R. 29 E., M. D. M., 9.6 acres.	250.00	Jan. 9, 1908
Douglass, R. L.	Canal rights of way	1.00	Dec. 14, 1907
Downs, L. L.	do.	1.00	Aug. 15, 1907
Epperson, Hattie, Eugene Griswold and wife.	do.	1.00	June 19, 1906
Ernst, George, and Lewis and Flora Hardy.	do.	1.00	Jan. 16, 1907
Ernst, Geo., Geo. W. Hulen, and Thos. Toomy.	do.	1.00	Jan. 4, 1907
Ernst, Geo. D., and Florence M.	do.	1.00	Jan. 11, 1907
Ferguson, J. W., and Mrs. Isabelle Smitten.	do.	1.00	July 3, 1906
Fulton, R. L.	do.	1.00	Nov. 18, 1907
Garaventa, John.	do.	1.00	Aug. 13, 1907
Gates, Herbert W.	do.	1.00	Aug. 27, 1907
Grimes, W. C.	do.	1.00	Aug. 22, 1907
Harmon, Wm. A.	do.	1.00	Feb. 12, 1907
Harriman, E. S., and Georgia M.	do.	1.00	Dec. 10, 1906
Hepppner, A. H., and wife, and Geo. Ernst.	do.	1.00	Nov. 9, 1907
Inman, Frank W.	do.	1.00	Mar. 1, 1907
Jeffrey, Jessie H., and Mrs. L. N. Wightman.	do.	1.00	Aug. 23, 1907
Kaiser, L. A. and Dora R.	do.	1.00	Jan. 28, 1907
Kaiser, Wm. F., and wife.	Part of SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 24, T. 19 N., R. 26 E., and of SW. $\frac{1}{4}$ sec. 19 and NW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 30, T. 19 N., R. 27 E., M. D. M., 92.65 acres.	750.00	Mar. 7, 1908
Kelly, Rebecca.	Canal rights of way	1.00	July 5, 1906
Krummes, Alice.	do.	1.00	Aug. 23, 1907
Krummes, Sam.	do.	1.00	Aug. 9, 1907
Larson, Wm. A.	do.	1.00	Feb. 4, 1907
Lee, W. R.	do.	1.00	July 6, 1906
Lofthouse, Ralph.	do.	1.00	Aug. 31, 1907
Lofthouse, James C., and W. W. Williams.	do.	1.00	Aug. 7, 1907
McLane, H. F.	do.	1.00	July 13, 1906
Markwell, Paris T.	do.	1.00	Aug. 24, 1907
Mills, Chas. E.	do.	1.00	Aug. 28, 1907
Mitchell, Geo. H.	do.	1.00	Feb. 9, 1907
Monte, Giovanni.	do.	1.00	Aug. 14, 1907
Oar, Frank.	do.	1.00	May 18, 1907
Oatz, John.	do.	1.00	July 11, 1906
O'Keefe, Daniel.	do.	1.00	Nov. 13, 1908
Peterson, Frank G.	do.	1.00	Dec. 18, 1907
Phillips, Henry W., and Walter A., and Frank Gibbs.	do.	1.00	Mar. 1, 1907
Smith, Edgar C. and Matilda.	do.	1.00	Aug. 28, 1907
Smith, Franklin S.	do.	1.00	Feb. 26, 1908
Taylor, Clyde V., and Elmer Cobb.	do.	1.00	Sept. 12, 1907
Vaughan, R. C.	do.	1.00	July 6, 1906
Verplank, J. B.	do.	1.00	Do.
Wightman, Chas. W.	do.	1.00	Do.
Wightman, F. M., and L. L. Downs.	do.	1.00	Aug. 27, 1907
Williams, W. H. and Nellie.	do.	1.00	Aug. 7, 1907

RIO GRANDE (LEASBURG) PROJECT, NEW MEXICO

Vendor.	Description.	Consideration.	Date of deed
Hare, R. F., and wife.....	Part of SW. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 30, T. 21 S., R. 1 E., N. M. P. M.	\$1.00	Dec. 10, 1907

WILLISTON PROJECT, NORTH DAKOTA

Charbonneau, Rosina.....	Lot 6, block 22, Bruegger's first addition to Williston.	\$125.00	Aug. 6, 1907
Shikany, Shada.....	Lot 5, block 22, Bruegger's first addition to town of Williston.	200.00	Sept. 23, 1907
Williston Land Co.....	Part of SE. $\frac{1}{4}$ sec. 14, T. 154 N., R. 101 W., 5th P. M., 0.46 acre.	5.00	May 11, 1907
Do.....	Part sec. 13, T. 154 N., R. 101 W., 5th P. M., 1 acre.	50.00	Feb. 19, 1908

KLAMATH PROJECT, OREGON

Boggs, Henry L., and wife...	Part of NW. $\frac{1}{4}$ sec. 14, T. 39 S., R. 9 E., W. M. 0.39 acres.	\$1.00	Dec. 19, 1908
Boyd, Mrs. F. E.....	Part of E. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 9 and of W. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 10, T. 40 S., R. 9 E., W. M.	1.00	Dec. 27, 1907
Breitenstein, Annie, and husband.....	Part of lot 1, sec. 32, T. 38 S., R. 9 E., W. M. 1 acre.	2,000.90	Oct. 30, 1907
Casey, Robert, and wife.....	Part of sec. 20, T. 39 S., R. 10 E., W. M. 4.7 acres.	70.50	Dec. 11, 1907
Cann, Henry, and wife.....	Part of SW. $\frac{1}{4}$ sec. 16, T. 39 S., R. 10 E., W. M. 6.2 acres.	155.90	Oct. 26, 1907
Emmitt, Robert A., and wife.....	Parts of SW. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 28, S. $\frac{1}{4}$ SE. $\frac{1}{4}$, S. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 29, NW. $\frac{1}{4}$, NW. $\frac{1}{4}$ SW. $\frac{1}{4}$, and lot 1, sec. 32, T. 39 S., R. $\frac{1}{4}$ E., W. M.	1.00	Dec. 23, 1907
Grigsby, Basil S., and wife.....	Parts of secs. 15, 16, 17, 21, and 22, T. 39 S., R. 10 E., W. M. 20.99 acres.	\$24.75	Dec. 17, 1907
Johnson, Ira C., and wife.....	Part of NE. $\frac{1}{4}$ NW. $\frac{1}{4}$ and W. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 12, T. 40 S., R. 9 E., W. M. About 10 acres.	242.50	May 14, 1908
Jery, James W.....	Parts of E. $\frac{1}{4}$ SW. $\frac{1}{4}$ and W. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 4 and NW. $\frac{1}{4}$, W. $\frac{1}{4}$ NE. $\frac{1}{4}$, NW. $\frac{1}{4}$ SE. $\frac{1}{4}$, and NW. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 9, T. 40 S., R. 9 E., W. M.	1.00	Dec. 21, 1907
Low, Chas. C., and wife.....	Part of N. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 19, T. 39 S., R. 9 E., W. M. 4.8 acres.	96.00	Feb. 3, 1908
Low, Henry H., and wife.....	Right of way across S. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 19, T. 39 S., R. 10 E., W. M. 4.16 acres.	104.00	Feb. 21, 1908
Moore, Chas. S., and wife.....	Part of sec. 36, T. 39 S., R. 9 E., W. M. 20.96 acres.	890.80	June 3, 1908
Do.....	Part of sec. 36, T. 39 S., R. 9 E., W. M. 4.63 acres.	115.75	Feb. 15, 1908
Newton, A. H., and wife.....	Part of NW. $\frac{1}{4}$ sec. 36, T. 39 S., R. 9 E., W. M.	1.00	Dec. 31, 1907
Newton, H. L., and wife.....	Right of way across S. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 19, T. 39 S., R. 10 E., W. M. 0.67 acres.	25.00	Feb. 5, 1908
Short, Burrell W., and wife..	Strip of land across E. $\frac{1}{4}$ sec. 13, T. 39 S., R. 9 E., W. M.; also free right of way for laterals. 14.81 acres.	450.00	Jan. 26, 1907
Stearns, Orson A., and wife..	Parts of SE. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 22, W. $\frac{1}{4}$ NE. $\frac{1}{4}$, NW. $\frac{1}{4}$ SE. $\frac{1}{4}$, and lots 3, 4, and 5 in sec. 27; also of lots 1, 2, 3, 4, 5, 6, 7, 8, and 12 in sec. 34, and of lot 1 in sec. 35, T. 39 S., R. 8 E., W. M.	1.00	Dec. 21, 1907
Stevenson, J. G., and wife.....	Part of SE. $\frac{1}{4}$ sec. 36, 5.37 acres.....	134.25	Feb. 27, 1908
Do.....	Part of SE. $\frac{1}{4}$ sec. 36, T. 39 S., R. 9 E., W. M. 5.37 acres.	318.50	June 18, 1908

UMATILLA PROJECT, OREGON

Donnelly, Frank, and wife...	Feed canal right of way across sec. 25, T. 4 N., R. 28 E., W. M.	\$1,200.00	Nov. 12, 1907
Hoskins, Jas. C.....	Improvements and enhanced value of SW. $\frac{1}{4}$ sec. 31, T. 5 N., R. 30 E., W. M., Umatilla County, Oreg.	800.00	Aug. 19, 1907
Ramos, Joseph, and wife.....	Part of NE. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 21, and SW. $\frac{1}{4}$ NW. $\frac{1}{4}$ and NW. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 22, T. 3 N., R. 29 E., W. M., 6.1 acres.	2,275.00	Aug. 30, 1907
Reeves, W. T., and wife, and L. B. Gilman.	Part of NE. $\frac{1}{4}$ sec. 34, T. 4 N., R. 29 E.....	77.40	Oct. 5, 1907
Ward, Chas. J., and wife.....	Part of W. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 5, T. 3 N., R. 25 E., W. M., 5.4 acres.	1.00	June 18, 1908
White, Susan, and husband..	Part NE. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 31, and E. $\frac{1}{4}$ W. $\frac{1}{4}$ sec. 30, T. 4 N., R. 29 E., W. M.	175.00	Dec. 9, 1907

BELLE FOURCHE PROJECT, SOUTH DAKOTA

Vendor.	Description.	Consideration.	Date of deed.
Littlefield, Samuel S.	Right of way for south canal through NW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 12, and NE. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 11, T. 7 N., R. 5 E., 7.95 acres.	\$150.00	Apr. 16, 1908
Littlefield, Tryphena C.	Right of way for south canal through the S. $\frac{1}{4}$ of NW. $\frac{1}{4}$ and SW. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 12, T. 7 N., R. 5 E., 9.1 acres.	182.00	June 12, 1907
Long, Agnes A.	Right of way for south canal through NW. $\frac{1}{4}$ NE. $\frac{1}{4}$ NE. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 35, and SE. $\frac{1}{4}$ SW. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 26, T. 8 N., R. 5 E., 13.68 acres.	271.60	Oct. 29, 1907
Thomas Potts estate.	Right of way for south canal through the SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 12, and NE. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 13, T. 8 N., R. 4 E., 8.15 acres.	163.00	Oct. 18, 1907
Richter, Gustave K.	Right of way for south canal through the SW. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 12, T. 8 N., R. 4 E., 4.6 acres.	128.00	Mar. 2, 1908

STRAWBERRY VALLEY PROJECT, UTAH

Blumenthal, Henry G., and wife, Myrta M.	Lot adjoining Provo office property.	\$250.00	Aug. 5, 1907
Boren, Eliza R.	Provo office property.	4,950.89	Do.
Dahle, Susana Evans, administratrix for David Evans estate.	Right of way for power canal, 5.9 acres, more or less.	127.50	June 29, 1908
Pace, Wm. F., and Louise M.	Right of way for wagon road and telephone line.	109.00	Oct. 1, 1906

OKANOGAN PROJECT, WASHINGTON

Sayles, Clarence H., and wife.	Lots 15, 16, 17, 18, and 19, in Block X, Conco-nully Mining Co.'s first addition to town of Conco-nully, Wash.	\$250.00	Nov. 7, 1907
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YAKIMA VALLEY PROJECTS, WASHINGTON

Cobb, Addison.	Part of S. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 10, T. 14 N., R. 16 E., W. M., 33.75 acres.	\$1,012.50	Aug. 13, 1907
Morgiel, Frank.	SE. $\frac{1}{4}$ sec. 8 and NE. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 17, T. 21 N., R. 14 E., W. M., 200 acres.	5,500.00	July 12, 1907
Weddle, J. S., and wife.	Right of way for telephone and electric transmission line.	25.00	June 25, 1907

SHOSHONE PROJECT, WYOMING

Cody, William F.	W. $\frac{1}{4}$ NW. $\frac{1}{4}$ and NW. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 13, NE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 14, T. 52 N., R. 103 W., 6th P. M., with improvements, 160 acres.	\$2,850.00	Jan. 27, 1908
Marston, C. A., and Hattie F.	S. $\frac{1}{4}$ SE. $\frac{1}{4}$ and S. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 10 and N. $\frac{1}{4}$ NE. $\frac{1}{4}$ and N. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 15, T. 52 N., R. 103 W., 6th P. M., 320 acres.	11,000.00	—, 1908
Trimmer, T. S., and D. M. ...	S. $\frac{1}{4}$ SW. $\frac{1}{4}$ and SW. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 11; N. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 14; SE. $\frac{1}{4}$ NE. $\frac{1}{4}$ and NE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 9; S. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 10; E. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 11 and W. $\frac{1}{4}$ SW. $\frac{1}{4}$ (except 1 acre) sec. 12, T. 52 N., R. 103 W., 6th P. M.	12,000.00	Aug. 29, 1907

TRANSPORTATION

The general freight contracts listed in the sixth annual report are still in force and the following transportation companies have agreed to extend the general concessions carried in the contracts to include all shipments on account of reclamation work, thus enabling the purchase of clothing, provisions, supplies, etc., by the service in

markets where a marked saving in both purchase price and freight charges may be obtained:

Atchison, Topeka and Santa Fe Railway System.
 Chicago, Burlington and Quincy Railroad Company.
 Chicago, Rock Island and Pacific Railway.
 Gila Valley, Globe and Northern Railway Company.
 Illinois Central Railroad Company.
 Maricopa and Phoenix and Salt River Valley Railroad Company.
 Northern Pacific Railway.
 Oregon Railroad and Navigation Company.
 Oregon Shortline Railroad.
 Southern Pacific Company, Atlantic system: Galveston, Harrisburg and San Antonio Railway Company; Galveston, Houston and Northern Railway; Southern Pacific Company, Atlantic Steamship Lines; Texas and New Orleans Railroad Company; Morgan's Louisiana and Texas Railroad and Steamship Company, and Louisiana Western Railroad.
 Southern Pacific Company.
 Union Pacific Railroad Company.

The special freight rates listed in the sixth annual report are still in force and the following transportation companies have made special freight rates from important shipping points to particular points of delivery on one or more of the various projects, resulting in considerable benefit to the service:

Chicago and Northwestern Railway Company.
 Chicago, Burlington and Quincy Railroad Company.
 Chicago, Lake Shore and Eastern Railway Company.
 Chicago, Milwaukee and St. Paul Railway.
 Colusa and Lake Railroad.
 Denver and Rio Grande Railroad.
 Great Northern Railway Line.
 Lake Shore and Michigan Southern Railway.
 North Yakima and Valley Railroad.
 Oregon Railroad and Navigation Company.

On July 1, 1907, there were on hand in the transportation office bills for freight charges filed by the transportation companies amounting to \$173,705.02. There were received during the fiscal year for administrative examination bills amounting to \$463,093.88. Bills amounting to \$387,463.82 were examined and bases for settlement thereof were arranged with the claimants, leaving on hand June 30, 1908, unsettled bills amounting to \$249,335.08.

Claims made by transportation companies on the freight bills settled during the fiscal year amount to \$387,463.82, and the amount found due thereon after examination by the transportation office was \$369,583.04. The commercial charges on these bills would have been \$577,830.42, thus resulting in a saving to the reclamation fund of \$208,247.38.

On June 30, 1908, the records of the transportation office showed the status of expense bills covering shipments consigned to contractors to be as follows:

Expense bills on hand July 1, 1907-----	\$83,591.09
Expense bills received during year-----	113,227.37
Expense bills on which claims were filed with railroads during year..	10,487.71
Expense bills not subject to concessions discarded-----	32,707.92
Expense bills on hand June 30, 1908-----	153,622.83
Refunds on expense bills during year-----	14,959.29

From July 1, 1907, to June 30, 1908, there were 1,735 bills of lading issued by the transportation office.

The purchasing of supplies for field use during the year has been conducted on a much enlarged scale, a total of 930 purchases amounting to \$412,102.01 having been made by the transportation office.

CEMENT TESTS

The amount of cement for which tests were made by the cement-testing laboratory during the fiscal year ending June 30, 1908, was 131,631 barrels, of which 122,631 barrels were accepted and 9,000 barrels were rejected. The companies manufacturing this cement and the projects for which it was furnished are as follows: Iola Portland Cement Company, Iola, Kans. (Iola brand), for Payette-Boise, Rio Grande, Salt River, and Yuma projects; Marquette Cement Manufacturing Company, La Salle, Ill. (Marquette brand), for Lower Yellowstone, North Platte (Pathfinder dam and Interstate canal), Shoshone, Sun River, and Williston projects; Portland Cement Company, Portland, Colo. (Ideal brand), for Minidoka, North Platte (Pathfinder dam and Interstate canal), Shoshone, and Uncompahgre projects; United Kansas Portland Cement Company, Iola and Independence, Kans. (Sunflower brand), for Carlsbad, Garden City, Payette-Boise, Rio Grande, Salt River, and Yuma projects; Universal Portland Cement Company, Chicago, Ill. (Universal brand), for Buford-Trenton, Huntley, Lower Yellowstone, North Platte (Pathfinder dam and Interstate canal), Shoshone, Sun River, and Williston projects; Western Portland Cement Company, Yankton, S. Dak. (Yankton brand), for Belle Fourche project; Western States Portland Cement Company, Independence, Kans. (Cowboy brand), for Carlsbad and Strawberry Valley projects.

As stated in previous reports, the methods of testing used in the laboratory conform in general to those prescribed by the standard specifications for cement of the American Society for Testing Materials.

The regular sets of long-time tests mentioned in previous reports have been continued and some work has been done on sand tests for various projects. The question of the effect of alkali on Portland cement and concrete has been brought up during the year in connection with the disintegration of a few structures on some of the projects from this cause, and the whole subject is now under investigation by the structural materials laboratory of the United States Geological Survey.

The accompanying tabulation gives the average results of all tests on accepted cement made by the cement laboratory from July 30, 1904, to June 30, 1908, including both routine tests and also the results of long-time tests, so far as the latter have been obtained. The numbers in this table stand for the same brands as do the like numbers in the sixth annual report.

Tabulation of cement tests from July 30, 1904, to June 30, 1908

[Averages of tests of accepted cement]

Brand.	Quan- tity.	Fineness.		Setting time.		Specific gravity.	Tensile strength.				
		100 Passing No. sieve.	200 Passing No. sieve.	Initial.	Final.		Composition of briquets.	1 day.		7 days.	
								Number of tests.	Pounds per square inch.	Number of tests.	Pounds per square inch.
1.....	Barrels. 15,645	P. ct. 96.1	P. ct. 77.1	Hrs. m. 3 11	Hrs. m. 6 15	3.16	{Neat.. 3 to 1..	25	316	570	758
2.....	56,881	94.7	76.6	3 21	7 13	3.13	{Neat.. 3 to 1..	45	405	570	279
3.....	39,097	93.1	77.9	3 57	8 9	3.16	{Neat.. 3 to 1..	50	366	1,374	701
4.....	19,711	96.1	74.8	3 57	8 22	3.15	{Neat.. 3 to 1..	35	329	592	268
5.....	30,045	95.0	79.3	3 6	6 57	3.17	{Neat.. 3 to 1..	35	419	592	853
6.....	173,635	96.9	80.9	3 25	7 31	3.14	{Neat.. 3 to 1..	60	339	592	330
7.....	11,899	95.2	78.2	3 35	8 14	3.21	{Neat.. 3 to 1..	53	274	1,195	649
8.....	18,010	94.3	77.2	3 3	7 27	3.15	{Neat.. 3 to 1..	15	419	1,195	302
Total and average...	364,923	95.7	79.0	3 27	7 30	3.14	{Neat.. 3 to 1..	318	351	477	842
										477	322
										3,410	662
										3,410	265
										484	651
										484	278
										290	811
										290	316

Brand.	Tensile strength.											
	23 days.		3 months.		6 months.		1 year.		2 years.		3 years.	
	Number of tests.	Pounds per square inch.	Number of tests.	Pounds per square inch.	Number of tests.	Pounds per square inch.	Number of tests.	Pounds per square inch.	Number of tests.	Pounds per square inch.	Number of tests.	Pounds per square inch.
1.....	570	378	25	387	25	390	15	367	5	770	.....	.....
2.....	570	393	25	444	25	456	15	453	5	397	.....	.....
3.....	1,374	762	50	799	45	783	40	751	30	760	15	719
4.....	1,374	357	50	425	45	423	40	449	30	470	15	479
5.....	592	913	60	884	55	851	50	846	20	829	10	877
6.....	592	444	60	459	55	463	50	428	20	473	10	439
7.....	1,195	717	45	738	45	761	40	790	40	793	10	719
8.....	1,195	406	45	477	45	498	40	509	40	472	10	402
9.....	472	905	30	901	20	859	20	840	10	862	.....	.....
10.....	472	461	30	470	20	437	20	382	10	377	.....	.....
11.....	3,410	397	60	365	60	331	45	323	20	335	.....	.....
12.....	3,410	376	60	414	60	405	45	411	20	415	.....	.....
13.....	484	774	30	789	30	828	20	779	5	812	5	756
14.....	484	377	30	443	30	454	20	463	5	441	5	460
15.....	290	372	15	309	.....	.....	.....	.....	.....	.....	.....	.....
16.....	290	418	15	439	.....	.....	.....	.....	.....	.....	.....	.....
Total and average...	{ 8,387	395	315	332	230	323	230	810	130	803	40	763
	{ 8,387	389	315	446	230	446	230	443	130	451	40	447

FINANCES

RECLAMATION FUND

The act of June 17, 1902 (32 Stat. L., 388), provides that all moneys received from July 1, 1900, from the sale and disposal of public lands in certain States and Territories, and including the surplus of fees and commissions in excess of allowances to registers and receivers of the land office, and excepting the 5 per cent of the proceeds of the sales of public lands set aside by law for educational and other purposes, shall be reserved, set aside, and appropriated as a special fund to be known as the "reclamation fund."

So many influences affect the disposal of the public lands that it is difficult to forecast accurately what the receipts from such sources will be for future years. It was shown in the last annual report that, had the act been in operation from July 1, 1891, to June 30, 1900, the annual increment to the fund would have ranged from about \$1,000,000 to something over \$3,000,000. Beginning with the time when receipts from sales of public lands were made available for the purposes of irrigation, these receipts have largely increased in amount, and the total amount arising from these sources to the end of the fiscal year 1907 was \$41,227,366.58.

From an estimate made by the General Land Office after consideration of all receivers' accounts to June 30, 1908, it appears that the gross amount of such receipts from sales of lands and fees and commissions for the fiscal year ending June 30, 1908, is \$10,235,294.28. Of the corresponding amount for the fiscal year 1907, the net increment to the reclamation fund was 93.4 per cent, and on this basis the addition to the fund on account of the fiscal year 1908 will be \$9,559,764.86. Because of the fact that, as set out in the last annual report, the amounts annually accruing to the reclamation fund do not become available for reclamation purposes until after final audit and the issuance of an appropriation warrant, it has in the past been about six months after the last payments of each fiscal year have been made into the local land offices before such receipts have become available for use.

In a work of the magnitude of that conducted by the reclamation service physical difficulties can not always be foreseen, and it sometimes happens that there is an unexpected demand for funds that, if not met, results in loss and delay. During the past year, in order to provide against such contingencies, especially in the construction of the Laguna dam across the lower Colorado River and the Gunnison tunnel in Colorado, a request was made to the General Land Office and the Treasury Department for an earlier settlement of the accounts covering a portion of these receipts. Accordingly, the accounts covering the receipts from July to December, 1907, inclusive, in the States of North Dakota and Oregon were stated in advance of the other accounts, and the proceeds therefrom, amounting to \$1,981,891.32, were made available by an appropriation warrant dated July 31, 1908.

Table I shows the amounts of the annual accretions to the reclamation fund, by States, for the fiscal years 1901 to 1907, inclusive, the present and probable further additions for the fiscal year 1908, and

the estimated totals for the entire period from 1901 to 1908. The grand total, \$50,790,740.15, represents the entire amount that will probably have become available for expenditure prior to December 31, 1909.

TABLE 1.—*Annual accretions from sales of public lands, etc., during the fiscal years 1901 to 1908, by States*

State.	1901.	1902.	1903.	1904.	1905.
Arizona.....	\$42,586.16	\$30,187.35	\$48,360.20	\$63,266.02	\$50,368.46
California.....	205,030.40	298,240.36	830,221.40	482,077.16	498,488.37
Colorado.....	254,898.88	\$74,106.13	\$40,812.80	472,379.85	318,546.14
Idaho.....	206,645.36	300,803.27	650,331.95	493,697.20	383,221.74
Idaho, sales of town sites.....					
Kansas.....	20,188.78	28,946.94	27,836.50	32,478.56	30,473.91
Montana.....	367,342.31	405,035.40	558,071.40	466,708.41	349,629.75
Montana, sales of town sites.....					
Nebraska.....	102,968.24	132,234.04	136,728.70	118,766.59	179,136.10
Nevada.....	9,183.47	14,230.61	14,136.76	16,210.58	11,167.70
New Mexico.....	75,203.06	72,034.60	154,265.49	86,602.58	133,243.57
North Dakota.....	449,474.96	778,021.35	1,244,916.47	1,160,386.68	807,792.48
Oklahoma.....	370,464.93	638,330.44	864,766.83	763,511.39	490,629.78
Oregon.....	364,988.62	546,972.44	1,806,970.68	1,350,651.21	610,797.39
South Dakota.....	113,274.20	194,288.17	248,696.14	249,225.28	217,688.34
Texas.....					
Utah.....	98,416.00	48,408.38	88,872.28	48,716.82	77,662.81
Washington.....	257,180.95	536,907.82	1,109,299.54	696,271.34	451,773.36
Wyoming.....	206,989.59	178,773.24	279,709.18	325,283.92	195,045.40
Total.....	3,144,821.91	4,585,520.53	8,713,996.80	6,826,253.59	4,805,515.39
Cumulative total.....	3,144,821.91	7,730,342.44	16,444,339.04	23,270,592.63	28,076,108.02

State.	1906.	1907.	1908.		Total, 1901-1908, estimated.
			Actual.	Estimated. ^c	
Arizona.....	\$54,559.06	\$71,688.72		\$66,191.02	\$436,206.99
California.....	239,320.01	365,995.19		540,119.30	3,468,492.19
Colorado.....	534,068.16	613,520.03		713,565.14	3,830,917.22
Idaho.....	315,175.56	659,690.09		503,582.66	
Idaho, sales of town sites.....		61,860.00	\$1,875.00		3,567,882.83
Kansas.....	75,370.50	88,937.79		153,343.93	457,526.91
Montana.....	466,637.10	740,562.33		657,120.88	
Montana, sales of town sites.....		8,930.35	1,733.71		4,041,661.82
Nebraska.....	74,704.24	73,553.61		126,103.22	946,190.64
Nevada.....	35,843.13	45,154.36		60,773.75	206,700.36
New Mexico.....	202,015.97	882,856.77		539,259.42	1,645,461.46
North Dakota.....	933,012.96	1,101,638.16	a 1,133,851.90	b 758,323.34	8,367,418.30
Oklahoma.....	514,325.73	530,664.25		575,909.18	4,748,602.53
Oregon.....	491,069.48	1,519,958.62	c 848,039.42	b 545,341.18	8,173,789.04
South Dakota.....	279,300.55	505,779.42		756,904.34	2,565,156.44
Texas.....					
Utah.....	114,595.02	141,156.18		157,773.64	775,601.23
Washington.....	489,958.56	703,902.62		847,499.22	5,092,793.41
Wyoming.....	326,380.47	378,103.57		576,033.32	2,466,318.78
Total.....	5,166,336.50	7,984,922.08	1,985,500.03	7,577,873.54	50,790,740.15
Cumulative total.....	33,242,444.52	41,227,366.58	43,212,866.61	50,790,740.15	50,790,740.15

^a Six months, July to December, 1907.

^b Six months, January to June, 1908.

^c From estimate of General Land Office, October 14, 1908.

ALLOTMENTS

From time to time as funds have become available and as the preliminary investigations of the several projects have shown their feasibility and practicability, the construction of such projects has been authorized and allotments therefor have been made with a view

to providing the funds necessary to carry on the work. It has already been shown that the annual additions to the fund become available about January 1 of each year and because of that fact the annual allotments have been based upon the calendar year rather than upon the fiscal year. In making these allotments it has been found advisable to outline a general fiscal programme. The principal engineers of the service are asked to submit their plans of work and estimate of the funds deemed necessary to carry them out. A conference is then called for consideration of these plans and estimates, and finally a programme is formulated and submitted to the Secretary of the Interior. Two such conferences have thus far been held, namely, at Fallon, Nev., July 24 to 31, 1907, and at Mitchell, Nebr., July 27 to 31, 1908.

Table 2 shows the approved allotments for projects, town-site operations, and general office administration in the following periods of calendar years, 1902-6, 1907, 1908, and 1909.

TABLE 2.—*Allotments for irrigation projects, town-site operations, and general office administration in periods of calendar years to December 31, 1909*

State.	Per cent chargeable.	Project.	1902-1906.	1907.
Arizona		Salt River	\$3,059,412.22	\$1,390,000.00
Arizona-California	83, 17	Yuma	805,981.00	948,000.00
California		Orland	8,776.19	6,000.00
California-Oregon	26, 75	Klamath	710,384.11	670,000.00
Colorado		Grand Valley	8,712.20	1,287.80
Do.		Uncompahgre	1,907,790.37	972,000.00
Idaho		Minidoka	1,397,115.00	432,000.00
Do.		Payette-Boise	565,825.76	884,000.00
Kansas		Garden City	33,797.88	226,000.00
Montana		Huntley	351,381.07	433,000.00
Do.		Saint Mary	139,510.64	117,488.36
Do.		Sun River	79,796.68	278,000.00
Montana-North Dakota	70, 30	Lower Yellowstone	550,478.90	1,347,000.00
Nebraska-Wyoming	70, 30	North Platte	1,543,726.20	1,808,000.00
Nevada		Truckee-Carson	3,345,855.32	476,000.00
New Mexico		Carlsbad	372,843.77	199,000.00
Do.		Hondo	348,706.18	9,000.00
New Mexico-Texas	60, 40	Rio Grande	48,404.15	1,000.00
Do.		Leasburg diversion	11,603.74	185,000.00
North Dakota		Buford-Trenton	14,018.24	288,000.00
Do.		Nesson	18,000.00	.....
Do.		Williston	65,505.74	309,000.00
Oklahoma		Cimarron	506.26	6,000.00
Oregon		Umatilla	128,117.13	578,000.00
South Dakota		Belle Fourche	561,925.21	810,000.00
Utah		Strawberry Valley	119,139.88	300,000.00
Washington		Okanogan	96,420.80	262,000.00
Do.		Tieton	70,000.00	534,000.00
Do.		Sunnyside	301,000.00	207,000.00
Do.		Wapato	15,747.33	3,252.67
Wyoming		Shoshone	715,954.34	1,418,000.00
		Secondary projects	570,000.00	.....
		Townsite operations	5,270.08	7,000.00
		General office administration	27,089.22	23,407.40
Total			18,092,800.20	15,059,437.23

•Exclusive of Leasburg diversion.

TABLE 2.—Allotments for irrigation projects, town-site operations, etc.—Cont'd.

State.	Per cent chargeable.	Project.	1908.	1909.	Total 1902-1909.
Arizona.....		Salt River.....	\$1,400,587.78	\$1,200,000	\$7,050,000
Arizona-California.....	83, 17	Yuma.....	1,121,019.00	580,000	3,455,000
Do.....		Colorado River.....	30,000.00	15,000	45,000
California.....		Orland.....	203,223.81	340,000	558,000
California-Oregon.....	25, 75	Klamath.....	312,615.89	416,000	2,109,000
Colorado.....		Grand Valley.....	40,000.00	50,800	100,000
Do.....		Uncompahgre.....	635,209.63	400,000	3,915,000
Idaho.....		Minidoka.....	188,884.40	463,000	2,491,000
Do.....		Payette-Boise.....	790,174.24	250,000	2,500,000
Kansas.....		Garden City.....	95,202.14	30,000	385,000
Montana.....		Huntley.....	55,618.93	40,000	890,000
Do.....		Milk River.....	250,000.00	240,000	490,000
Do.....		Saint Mary.....		20,000	277,000
Do.....		Sun River.....	129,203.32	42,000	530,000
Montana-North Dakota.....	70, 30	Lower Yellowstone.....	672,521.10	110,000	2,680,000
Nebraska-Wyoming.....	70, 30	North Platte.....	588,273.80	290,000	4,230,000
Nevada.....		Truckee-Carson.....	129,144.68	167,000	4,108,000
New Mexico.....		Carlsbad.....	68,156.23	40,000	680,000
Do.....		Hondo.....	12,291.82	10,000	380,000
New Mexico-Texas.....	60, 40	Rio Grande.....	15,595.88	10,000	75,000
Do.....		Leasburg diversion.....	13,396.26		210,000
North Dakota.....		Bowman.....	10,000.00		10,000
Do.....		Buford-Trenton.....	13,981.76	208,000	524,000
Do.....		Nesson.....			18,000
Do.....		Washburn.....	10,000.00		10,000
Do.....		Williston.....	99,494.26	120,000	594,000
Oklahoma.....		Cimarron.....	5,491.74		12,000
Oregon.....		Central Oregon.....	35,000.00	40,000	75,000
Do.....		Umatilla.....	358,882.87	121,000	1,188,000
South Dakota.....		Belle Fourche.....	628,074.79	350,000	2,360,000
Utah.....		Strawberry Valley.....	210,860.11	180,000	810,000
Washington.....		Okanogan.....	82,579.20	79,000	534,000
Do.....		Tieton.....	383,000.00	482,000	1,469,000
Do.....		Sunnyside.....	373,000.00	518,000	1,399,000
Do.....		Wapato.....		100,000	119,000
Wyoming.....		Shoshone.....	1,041,045.66	412,000	3,587,000
		Secondary projects.....		100,000	670,000
		Townsite operations.....	10,729.92		23,000
		General office administration.....	149,503.38		200,000
Total.....			10,172,762.57	7,413,000	50,738,000

* Exclusive of Leasburg diversion.

EQUALIZATION OF EXPENDITURES BETWEEN STATES WITHIN TEN-YEAR PERIODS

With a view to carrying out the provisions of section 9 of the reclamation act, definite principles have been laid down and followed in making allotments for work in the several States. Section 9 requires the Secretary of the Interior to expend the major portion of the reclamation fund arising within each State and Territory for the benefit of arid and semiarid lands within the limits of such State or Territory, with provisions for the temporary use of such portion as may seem advisable in any other State or Territory, subject to return within each ten-year period after the passage of the reclamation act, and also subject to conditions of practicability and feasibility.

With a view to conforming to these requirements, the following principles have been adopted, as announced in the last annual report:

The first controlling factor in such equalization is time, which the section quoted says shall be "within each ten-year period after the passage of this act." The act was passed June 17, 1902. The service was organized July 8, 1902. The accounts are kept by quarters and fiscal years ending on June 30 each. The first ten-year period will therefore be taken to end on June 30, 1912.

The second controlling factor in such equalization is the relation of the major portions of the receipts from the several States, subject to conditions of practicability and feasibility. The receipts of each fiscal year become available

about the first of the following calendar year. The available funds June 30, 1912, will therefore have included the receipts for the fiscal years 1901 to 1911, inclusive, and at that time the expenditures within each State should at least equal 51 per cent of the receipts from that State for 1901 to 1911, inclusive, subject to conditions of practicability and feasibility, as set out in the section.

It is probable, however, that since the receipts for the fiscal year 1911 must provide all the funds available during the calendar year 1912, the date for distributing the expenditures within the several States in accordance with the provisions of section 9 should be December 31, 1912, instead of June 30 of that year.

It has not been an easy matter to comply with the requirements of this section, for, as stated in the first annual report, page 74,

The receipts in the various States and Territories are not in proportion to their needs in irrigation construction. Nevada, Arizona, and Utah contain probably the largest proportion of arid areas in comparison with their total extent and the sales therein produce the smallest amount for the reclamation fund.

Nevertheless, this requirement has not been overlooked, and in spite of the difficulty of finding in some States feasible irrigation projects within practicable limits of cost and in spite of the attractiveness of other irrigation projects in States that were already receiving their share of the fund, the expenditures to December 31, 1907, had equaled or exceeded the restricted fund in all but five States; the expenditures to December 31, 1908, will have exceeded the restricted funds in all but four States, and the proposed expenditures to December 31, 1909, will have then exceeded the restricted funds in all but three States.

Tables 3, 4, 5, and 6 show, respectively, the restricted funds on December 31, 1907, expenditures on the same date, the restricted funds on December 31, 1909, and the allotments to the same date. A comparison of Tables 4 and 6 will show the degree to which the disproportion in expenditures will have been overcome during the intervening two years. California and Washington, in which the restricted funds had not been expended to December 31, 1907, will on or before December 31, 1909, have received more than their restricted funds on projects within those States.

TABLE 3.—Total and restricted funds available to December 31, 1907, by States

State.	Total funds.			Restricted fund (51 per cent).
	Relative order.	Per cent.	Amount.	
Arizona.....	14	.9	\$298,327.25	\$152,146.90
California.....	6	7.7	2,562,377.70	1,306,812.63
Colorado.....	7	7.5	2,503,802.05	1,276,939.04
Idaho.....	8	7.3	2,411,735.08	1,229,984.89
Kansas.....	15	.6	215,245.19	109,775.05
Montana.....	5	7.9	2,636,390.84	1,344,559.33
Nebraska.....	11	2.2	746,553.81	380,742.44
Nevada.....	16	.3	100,772.25	51,393.85
New Mexico.....	12	2.1	723,365.27	368,916.29
North Dakota.....	1	16.1	5,373,604.90	2,740,538.50
Oklahoma.....	3	10.9	3,642,029.10	1,857,434.84
Oregon.....	2	16	5,260,449.82	2,682,820.41
South Dakota.....	10	3.9	1,302,472.68	664,261.06
Texas.....	17			
Utah.....	3	1.4	476,671.41	243,102.42
Washington.....	4	10.6	3,541,391.57	1,806,109.70
Wyoming.....	9	4.6	1,512,181.89	771,212.76
Unrestricted fund.....				16,320,611.70
Total.....		100	33,307,370.81	33,307,370.81

TABLE 4.—Total expenditures to December 31, 1907, by States *

State.	Total expenditure.		
	Relative order.	Per cent.	Amount.
Arizona.....	1	18.3	\$6,095,536.32
California.....	13	2.1	701,126.38
Colorado.....	5	8.5	2,841,497.22
Idaho.....	3	9.7	3,204,542.49
Kansas.....	15	.8	273,285.96
Montana.....	6	7.7	2,550,825.61
Nebraska.....	7	5.9	1,974,137.58
Nevada.....	2	11.4	3,880,188.82
New Mexico.....	11	3.5	1,163,238.42
North Dakota.....	12	2.9	962,546.91
Oklahoma.....	16	.2	63,263.20
Oregon.....	8	5.3	1,749,645.57
South Dakota.....	10	3.8	1,249,784.36
Texas.....	17	.1	19,922.91
Utah.....	14	1.4	455,849.80
Washington.....	9	4.3	1,453,771.71
Wyoming.....	4	9	3,061,836.70
Total expenditures in reclamation work.....			31,586,083.96
Water right charges repaid.....			130,667.38
Total net investment in reclamation work.....			31,455,416.58
Investment, Indian irrigation, etc.....			85,395.71
Unexpended funds.....			1,806,568.32
Total.....		100	33,307,370.81

* Expenditures for interstate projects are divided between States on the basis of estimated irrigable area in each, as follows: Yuma, 83 per cent to Arizona, 17 per cent to California; Klamath, 25 per cent to California, 75 per cent to Oregon; Lower Yellowstone, 70 per cent to Montana, 30 per cent to North Dakota; North Platte, 70 per cent to Nebraska, 30 per cent to Wyoming; Rio Grande, 60 per cent to New Mexico, 40 per cent to Texas.

TABLE 5.—Total and restricted funds (estimated) available to December 31, 1909, by States

State.	Total funds.			Restricted fund (\$1 per cent).
	Relative order.	Per cent.	Amount.	
Arizona.....	15	.9	\$436,206.99	\$222,465.56
California.....	8	6.8	3,468,462.19	1,768,931.02
Colorado.....	6	7.5	3,830,917.22	1,963,767.78
Idaho.....	7	7	3,567,882.83	1,819,620.24
Kansas.....	14	.9	457,526.91	233,338.72
Montana.....	5	8	4,041,661.82	2,061,247.53
Nebraska.....	12	1.9	946,190.64	482,557.23
Nevada.....	16	.4	206,700.36	105,417.18
New Mexico.....	11	3.2	1,645,481.46	839,195.55
North Dakota.....	1	16.5	8,367,418.30	4,267,383.33
Oklahoma.....	4	9.3	4,748,602.53	2,421,787.29
Oregon.....	2	16.1	8,173,789.04	4,168,632.41
South Dakota.....	9	5.1	2,565,156.44	1,308,228.78
Texas.....				
Utah.....	13	1.5	775,601.23	395,556.63
Washington.....	3	10	5,092,793.41	2,597,394.64
Wyoming.....	10	4.9	2,466,318.78	1,257,822.58
Unrestricted fund.....				24,837,462.66
Total.....		100	50,790,740.15	50,790,740.15

TABLE 6.—Total allotments to December 31, 1909, by States *

State.	Total allotment.		
	Relative order.	Per cent.	Amount.
Arizona.....	1	15	\$7,637,350
California.....	7	7.9	3,997,900
Colorado.....	6	7.9	4,015,000
Idaho.....	2	9.8	4,991,000
Kansas.....	15	8	385,000
Montana.....	5	8	4,053,000
Nebraska.....	9	5.8	2,961,000
Nevada.....	4	8.1	4,108,000
New Mexico.....	13	2.6	1,315,000
North Dakota.....	12	8.9	1,960,000
Oklahoma.....	17	1	12,000
Oregon.....	10	5.6	2,842,750
South Dakota.....	11	4.6	2,350,000
Texas.....	16	1	30,000
Utah.....	14	1.6	810,000
Washington.....	8	6.9	3,521,000
Wyoming.....	3	9.6	4,856,000
Miscellaneous ^b		1.7	893,000
Total.....		100	50,738,000

*Allotments for interstate projects are divided between States on the basis of estimated irrigable area in each, as follows: Yuma, 83 per cent to Arizona, 17 per cent to California; Klamath, 25 per cent to California, 75 per cent to Oregon; Lower Yellowstone, 70 per cent to Montana, 30 per cent to North Dakota; North Platte, 70 per cent to Nebraska, 30 per cent to Wyoming; Rio Grande, 60 per cent to New Mexico, 40 per cent to Texas.

^b Miscellaneous includes allotments for secondary projects, town-site operations, and general expenses, the expenditures for which will eventually be divided by States.

CASH TRANSACTIONS AND BALANCES

In most government accounting the practice has been to limit the bookkeeping entries to completed cash transactions, and following that plan the general cash account has been used heretofore in this service as the controlling statement for all other accounts and statements. Statements of this kind appeared in the fifth and sixth annual reports. But the cash transactions alone do not show the financial condition of the Reclamation Service, and for over a year past the accounts have been so kept as to show other assets and liabilities. The cash account, however, must, if correct, agree with the Treasury Department's statements of funds made available by appropriation and repayment and of expenditures or withdrawals. Table 7 shows a condensed statement of cash appropriated, collected, disbursed, and on hand; Table 8, a reconciliation of the amounts of the appropriations, withdrawals, and balances, with published statements of the Treasury Department; and Table 9, the advances, collections, deposits, disbursements, and balances of fiscal officers to June 30, 1908.

TABLE 7.—*Cash account, reclamation fund (\$2 Stat. L., 388), to June 30, 1908*

Item.	Debtor.	Creditor.
Capital account:		
Appropriation warrant—		
No. 5, October 15, 1902.....	\$3,144,521.91	
No. 16, June 3, 1903.....	4,585,520.53	
No. 13, February 1, 1904.....	8,713,996.60	
No. 6, January 5, 1905.....	6,826,253.59	
No. 10, January 22, 1906.....	4,805,515.39	
No. 11, January 3, 1907.....	5,166,336.50	
No. 12, January 25, 1907.....	60,160.00	
No. 21, April 25, 1907.....	250.00	
No. 29, June 29, 1907.....	1,125.00	
No. 3, September 30, 1907.....	9,255.35	
No. 15, December 31, 1907.....	7,914,131.71	
No. 18, December 31, 1907.....	4,233.42	
No. 30, March 31, 1908.....	1,895.36	
No. 40, June 30, 1908.....	3,343.99	
Total.....	41,236,539.35	
Less surplus fund warrant No. 50, June 30, 1908, to correct appropriation warrants Nos. 8 and 18.....	5,964.06	\$41,230,975.29
Disbursements, 110,776 vouchers, per Table 10.....	\$36,967,498.95	
Collections, 3,913 vouchers, per Table 11.....		714,167.34
Balance with United States Treasurer, per Table 8.....	4,084,890.67	
Balances with fiscal officers, per Table 9.....	892,763.01	
Total.....	41,945,142.63	41,945,142.63

TABLE 8.—*Balances of reclamation fund in hands of United States Treasurer, June 30, 1903 to 1908, inclusive**

Fiscal year.	Appropriations.	Withdrawals.	Balances.
1903.....	\$7,730,342.44	\$268,517.23	\$7,461,825.21
1904.....	8,713,996.60	1,611,650.19	14,564,171.62
1905.....	6,826,253.59	3,882,020.53	17,508,404.68
1906.....	4,805,668.04	7,256,926.75	15,057,085.97
1907.....	5,227,871.50	12,785,346.80	7,489,610.67
1908.....	7,926,995.77	11,128,042.02	4,290,564.42
Totals and balance per treasury accounts, June 30, 1908.....	41,231,067.94	36,940,508.52	4,290,564.42
To reconcile with accounts of the Reclamation Service:			
For items in above, not in Reclamation Service accounts—			
Deduct for C/D 901, United States Treasurer, April 10, 1905, improperly carried as miscellaneous receipt, failing to reduce withdrawals, and appropriated by warrant No. 20, June 2, 1906, unduly increasing appropriation.....	\$2.65	\$2.65	
Deduct withdrawal on direct settlement.....	\$261.09		
For items not in above, but in Reclamation Service accounts—			
Deduct repayments on direct settlements.....	52.79		
Deduct repayments on deposits.....	2,695.04		
	\$3,008.92		
Add withdrawals on direct settlements.....	53,692.67		
Add withdrawals on requisitions.....	155,000.00		
	208,692.67	205,683.75	205,683.75
Total and balance per Reclamation Service accounts.....	41,230,975.29	37,146,094.62	4,084,890.67

* The appropriations, withdrawals, and balances for the respective years shown in this table are taken from the annual "Statement of balances, appropriations, and expenditures of the Government," published by the Treasury Department for the respective fiscal years, and the amounts for the years 1903, 1904, 1905, 1906, and 1907 are found on pages 52, 42, 42, 38, and 54, respectively, of the publications for those years.

TABLE 9.—*Advances, collections, deposits, disbursements, and balances of fiscal officers to June 30, 1908*

Fiscal officers.	Advances.	Collections.	Deposits.	Disbursements.	Balances.
Arthur, W. S.	\$230,500.00	\$50.59	\$38,178.57	\$192,372.02	.....
Barnhard, C. B.	1,212,000.00	41,815.70	42,272.89	1,208,157.37	\$3,385.44
Bickel, H. N.	547,400.00	4,620.22	56,515.70	455,504.52	40,000.00
Brace, F. W.	718,500.00	255.59	25,039.80	681,383.22	12,332.57
Brothers, W. A.	109,000.00	2,286.73	4,156.74	107,129.99	.....
Brydges, G. W.	79,000.00	3.42	12,740.98	66,262.44	.....
Buck, J. J.	207,900.00	226.64	67,278.50	113,986.77	25,961.37
Burrows, O. P.	329,900.00	704.70	704.70	283,148.48	37,751.52
Caden, Harry	20,000.00	37.50	37.50	8,256.24	11,743.76
Caldwell, H. T.	260,000.00	7,616.54	7,616.54	158,150.97	41,849.03
Catlin, F. D., jr.	150,000.00	18,257.38	18,257.38	106,052.92	41,947.06
Cavis, F. L.	926,000.00	127.59	45,617.80	880,509.79	.....
Clawson, R. R.	229,000.00	455.17	455.17	197,634.81	31,365.19
Costello, W. F.	225,000.00	7.00	7.00	2,666.29	22,333.71
Danforth, J. F.	82,300.00	270.41	11,487.15	71,083.26	.....
Dolphin, J. A.	115,000.00	177.94	177.94	101,882.71	13,117.29
Doanally, Ch. W.	200,000.00	283.23	42,914.91	149,484.00	7,803.33
Duganne, C. G.	551,500.00	105,801.40	163,697.99	468,693.41	25,000.00
Ebs, Geo. M.	223,000.00	387.80	4,121.03	188,828.44	30,448.33
Elting, R. C.	20,000.00	3,177.36	.....	.....	23,177.36
Essley, H. E.	1,710,000.00	7,538.35	67,426.84	1,606,048.19	44,063.32
Evans, G. W.	7,900.00	.....	756.39	7,143.61	.....
Gawler, J. C.	1,216,901.09	57,145.83	58,893.94	1,186,200.42	28,952.56
Gullickson, A. H.	923,000.00	1,576.00	47,558.92	877,017.08	.....
Hamilton, Esco	505,800.00	3,246.05	9,436.95	455,959.19	43,649.91
Hogue, C. C.	369,400.00	11,175.43	38,655.38	319,128.22	21,790.83
Hough, F. G.	55,000.00	3,684.98	3,684.98	36,755.26	18,244.74
Israel, F. J.	133,000.00	2,043.82	2,043.82	106,547.25	26,452.75
Jenkins, J. C.	34,000.00	40.50	46.74	33,993.76	.....
Jones, T. E.	127,100.00	1,083.71	16,734.24	61,449.47	50,000.00
Kirksey, F. W.	897,400.00	1,863.10	61,566.49	703,770.84	43,925.77
Lind, E. G.	1,051,000.00	148.70	26,318.15	1,024,830.55	.....
Lindeman, C. A.	959,000.00	28,617.76	28,617.76	927,275.47	31,724.53
Lyman, Carl	49,000.00	1.75	1.75	39,042.50	9,957.50
McChesney, J. D.	2,004,000.00	148,510.82	154,131.25	1,998,379.57	.....
McConnell, I. W.	179,000.00	54.49	219.33	178,835.16	.....
Mair, Geo. G.	110,000.00	245.10	39,705.14	23,980.91	48,559.06
Matthes, G. H.	10,000.00	11.20	5,426.63	4,584.57	.....
Moore, G. E.	214,000.00	9,812.10	28,269.00	152,850.27	42,692.83
Newman, E. D.	348,000.00	123.65	55,121.62	293,002.03	.....
Norton, S. B.	60,000.00	47,267.67	66,894.40	40,373.27	.....
Olberg, C. R.	86,000.00	56.70	12,531.96	73,524.74	.....
Olsen, S. T.	292,500.00	39.78	39,058.52	233,676.63	19,804.63
Paddock, C. M.	112,000.00	2,085.42	36,671.33	77,414.09	.....
Prall, C. T.	107,500.00	6.21	9,399.91	98,106.30	.....
Sargent, W.	158,500.00	6.82	4.24	158,502.58	.....
Seidemann, H. P.	376,500.00	43.07	24,746.71	351,796.36	.....
Shellenberger, A. H.	300,500.00	28.08	9,099.20	262,376.24	29,052.64
Spencer, J. W.	1,408,500.00	1,462.04	17,932.49	1,364,068.48	27,961.07
Swift, J. W.	265,500.00	60.37	19,253.35	246,307.02	.....
Vansant, G. N.	316,800.00	164.21	7,980.73	308,983.48	.....
Yates, H. A.	372,501.40	1,939.27	4,283.17	329,187.31	40,970.19
General Land Office receivers	.....	56,142.15	57,397.44	.....	Cr.1,255.29
Totals.....	20,836,402.49	572,718.04	1,492,147.06	19,024,210.46	892,763.01

APPROVED VOUCHERS, PAID, COLLECTED, AND TRANSFERRED

During the last three years the monthly disbursements have ranged from \$400,000 to over \$1,200,000, averaging a little over \$850,000, which is about the present rate. During the same period the monthly collections have ranged from \$2,000 to \$65,000. With the opening of additional areas for irrigation and the accrual of water-right charges thereon the amount of collections will rapidly increase. An interesting feature of the work is the extent to which it has been possible to utilize on other projects equipment and materials no longer required on those for which it was purchased; and also the use of manufacturing and other facilities on one project for the benefit of other projects. These interproject transactions are adjusted by transfer vouchers similar to the department vouchers used by many commercial organizations. Tables 10, 11, and 12 show the number and amounts of the disbursement, collection, and transfer vouchers re-

ording the transactions completed during each fiscal quarter for the six full fiscal years to June 30, 1908, tabulated by fiscal years, by fiscal quarters, and by calendar years.

TABLE 10.—*Disbursement vouchers paid to June 30, 1908*

By fiscal years.		By fiscal quarters.			By calendar years.		
Year.	Amount.	Quarter ended—	Number of vouchers.	Amount.	Year.	Amount.	
1903.....	\$269,094.47	Sept. 30, 1902	123	\$18,251.51	1902	\$98,981.37	
		Dec. 31, 1902	587	80,729.86			
		Mar. 31, 1903	632	82,601.13	1903	690,174.62	
		June 30, 1903	740	87,511.97			
1904.....	1,513,431.22	Sept. 30, 1903	1,778	217,021.46	1904	2,684,307.74	
		Dec. 31, 1903	2,364	303,040.06			
		Mar. 31, 1904	2,029	321,625.62	1905	5,109,538.27	
		June 30, 1904	2,726	671,744.08			
1905.....	3,767,921.78	Sept. 30, 1904	3,284	812,101.88	1906	9,585,708.74	
		Dec. 31, 1904	3,878	878,836.16			
		Mar. 31, 1905	3,241	871,721.49	1907	13,817,634.58	
		June 30, 1905	3,968	1,205,262.25			
1906.....	7,107,715.90	Sept. 30, 1905	5,581	1,604,912.35	1908	4,981,153.63	
		Dec. 31, 1905	5,513	1,427,642.18			
		Mar. 31, 1906	4,900	1,727,511.14	Total	36,967,498.95	
		June 30, 1906	5,969	2,347,650.23			
1907.....	12,533,916.06	Sept. 30, 1906	7,103	2,721,978.31			
		Dec. 31, 1906	7,815	2,788,569.06			
		Mar. 31, 1907	8,380	3,682,704.32			
		June 30, 1907	9,217	3,340,664.37			
1908.....	11,775,419.52	Sept. 30, 1907	9,127	3,471,601.07			
		Dec. 31, 1907	7,753	3,323,664.82			
		Mar. 31, 1908	6,798	2,482,944.74			
		June 30, 1908	7,170	2,498,208.89			
Total.....	36,967,498.95		110,676	36,967,498.95		36,967,498.95
Total disbursements by fiscal officers.....			105,760	19,024,210.46		
Total direct settlements by auditors of Treasury Department.....			4,916	17,943,288.49		

* Six months.

TABLE 11.—*Collection vouchers collected to June 30, 1908*

By fiscal years.		By fiscal quarters.			By calendar years.	
Year.	Amount.	Quarter ended—	Number of vouchers.	Amount.	Year.	Amount.
1903	\$242.37	Mar. 31, 1903	5	\$202.21	1903	\$328.66
		June 30, 1903	13	46.16		
		Sept. 30, 1903	2	74.31		
		Dec. 31, 1903	3	11.98		
1904	710.84	Mar. 31, 1904	10	416.78	1904	1,371.08
		June 30, 1904	107	207.77		
		Sept. 30, 1904	13	661.32		
		Dec. 31, 1904	27	85.21		
1905	1,338.85	Mar. 31, 1905	74	370.40	1905	13,032.24
		June 30, 1905	112	221.92		
		Sept. 30, 1905	57	6,066.77		
		Dec. 31, 1905	109	6,373.15		
1906	22,924.63	Mar. 31, 1906	138	8,178.25	1906	42,910.08
		June 30, 1906	60	2,306.46		
		Sept. 30, 1906	101	12,864.55		
		Dec. 31, 1906	124	19,580.82		
1907	157,984.45	Mar. 31, 1907	144	47,211.81	1907	427,890.97
		June 30, 1907	165	78,347.27		
		Sept. 30, 1907	310	202,160.11		
		Dec. 31, 1907	714	100,171.78		
1908	530,966.20	Mar. 31, 1908	698	53,262.13	1908	228,634.31
		June 30, 1908	927	175,372.18		
Total	714,167.34		3,913	714,167.34	714,167.34
Total collections by fiscal officers.....			3,854	572,718.04	
Total direct settlements by auditors of Treasury Department.....			59	141,449.30	

* Six months.

TABLE 12.—*Transfer vouchers approved to June 30, 1908*

By fiscal years.		By fiscal quarters.			By calendar years.	
Year.	Amount.	Quarter ended—	Number of vouchers.	Amount.	Year.	Amount
1905 ^a	\$2,275.45	June 30, 1905	12	\$2,275.45	1905	\$7,704.63
		Sept. 30, 1905	5	231.20		
		Dec. 31, 1905	20	5,097.88		
1906.....	445,806.96	Mar. 31, 1906	45	11,988.55	1906	704,003.51
		June 30, 1906	227	428,389.23		
		Sept. 30, 1906	87	182,524.09		
1907.....	508,093.42	Dec. 31, 1906	126	81,901.64	1907	1,088,808.73
		Mar. 31, 1907	116	78,016.26		
		June 30, 1907	120	167,051.43		
1908.....	1,030,342.16	Sept. 30, 1907	100	84,989.10	1908	186,601.14
		Dec. 31, 1907	93	758,751.94		
		Mar. 31, 1908	53	58,232.88		
		June 30, 1908	182	128,868.26		
Total.....	1,987,118.01		1,189	1,987,118.01		1,987,118.01

^a Three months.^b Nine months.^c Six months.

INVESTMENT IN VARIOUS PROJECTS

While the cash transactions alone do not fully show the financial status of the service and the several projects undertaken by it, they do show the actual amount invested in each undertaking and represent nearly 95 per cent of the total expense incurred. For convenience the various work under way is grouped under five general heads, as follows: Primary projects, those on which construction is under way or on which the surveys are being brought to a state where construction can soon be taken up; secondary projects, those on which preliminary studies and surveys are being continued with a view to securing the data necessary before a final determination of their feasibility and practicability can be made; town-site operations under the acts of April 16 and June 27, 1906 (34 Stat. L., 116 and 519), the expense of which is not reimbursable; Indian irrigation, projects on Indian reservations undertaken for the Office of Indian Affairs and for which repayment is made monthly by that office to the extent of the actual expense incurred; and general expense, for those expenditures that can not be directly charged to any project when first incurred, but that are subsequently transferred to projects on the basis of the benefits received. Tables 13, 14, and 15 show the total voucher transactions and net investment on each undertaking of these classes, and Table 16 gives a recapitulation of all such transactions shown in Tables 13, 14, and 15, together with cross references to Tables 10, 11, and 12.

TABLE 13.—*Voucher transactions and net investments of the United States on primary projects to June 30, 1908*

State.	Project.	Disbursement vouchers.	Transfer vouchers received.	Collection vouchers.	Transfer vouchers issued.	Net investments.
Arizona	Salt River	\$5,262,536.66	\$159,210.31	\$211,670.89	\$3,154.65	\$5,206,974.63
Arizona-California	Colorado River	24,114.71	2,201.76	707.33	224.30	25,384.84
Do.	Yuma	2,411,287.47	45,208.50	33,945.62	986.19	2,416,614.16
California	Orland	34,601.48	11,858.94	.27	42.80	45,417.35
California-Oregon	Klamath	1,296,478.16	36,951.97	16,615.55	9,651.50	1,267,163.06
Colorado	Grand Valley	15,681.92	2,325.81	.19		18,007.64
Do.	Uncompahgre	3,143,494.71	60,913.71	71,111.05	2,692.27	3,130,605.09
Idaho	Minidoka	1,853,700.52	47,628.94	10,823.91	16,456.31	1,874,046.24
Do.	Payette-Boise	1,831,048.36	40,519.95	4,756.00	2,442.41	1,864,366.90
Kansas	Garden City	288,611.22	7,260.55	647.55	3,643.79	291,580.43
Montana	Huntley	855,695.87	19,023.97	54,334.49	19,026.17	801,369.48
Do.	Milk River	94,180.58	6,549.58	150.69	1,627.47	96,952.00
Do.	St. Mary	245,892.88	8,998.45	6,969.32	9,205.27	241,716.39
Do.	Sun River	415,455.18	12,547.34	2,783.20	2,080.30	424,130.02
Montana - North Dakota	Lower Yellowstone	1,870,611.13	36,526.02	10,128.27	5,552.35	1,891,756.53
Nebraska - Wyoming	North Platte	2,820,833.66	539,797.49	14,444.17	8,045.45	3,328,141.53
Nevada	Truckee-Carson	\$,745,832.66	151,725.79	20,550.09	16,269.94	\$,880,847.52
New Mexico	Carlsbad	618,072.09	13,126.38	11,649.27	3,177.51	616,371.00
Do.	Hondo	353,462.16	9,997.46	2,193.05	541.18	360,725.38
New Mexico-Texas	Rio Grande	41,930.19	11,260.42	28.32	365.09	32,797.29
	Leasburg diversion	192,938.37	5,407.13	1,473.26	5,397.37	191,474.87
North Dakota	Bowman	8.20				8.20
Do.	Buford-Trenton	221,151.11	55,133.99	125.05	92,662.84	153,497.20
Do.	Nesson	7,002.76	29,774.81	4.14	19,774.60	16,998.74
Do.	Williston	245,242.61	68,589.06	387.08	32,160.10	381,284.48
Oklahoma	Clamarron	5,895.49	188.73		26.55	6,067.67
Oregon	Central Oregon	23,131.14		423.78		23,707.41
Do.	Umatilla	933,193.56	20,192.97	6,207.55	2,104.35	945,074.59
South Dakota	Belle Fourche	1,398,401.94	32,927.06	11,132.35	4,688.53	1,415,508.12
Utah	Strawberry Valley	507,636.32	11,097.16	24,039.51	6,026.85	490,077.11
Washington	Okanogan	377,978.23	8,997.04	1,975.14	1,849.78	383,150.40
Do.	Sunnyside	484,810.99	138,725.80	109,772.32	21,703.47	492,061.00
Do.	Tieton	583,764.04	154,492.03	5,965.37	5,037.83	727,252.87
Do.	Wapato	3,186.53	1,439.39			4,625.92
Wyoming	Shoshone	2,576,184.75	58,381.23	49,342.90	15,710.94	2,569,512.14
Total		34,887,194.61	1,790,702.68	689,357.42	312,280.15	35,676,259.73

* Exclusive of Leasburg diversion.

TABLE 14.—*Voucher transactions and net investments of the United States on secondary projects to June 30, 1908*

State.	Project.	Disbursement vouchers.	Transfer vouchers received.	Collection vouchers.	Transfer vouchers issued.	Net investments.
Arizona	Little Colorado	\$8,718.13		\$1.00		\$8,717.13
Do.	San Carlos	24,443.52	\$78.89	12.90		24,506.51
Do.	San Pedro	2,423.72		.35		2,423.37
California	Owens Valley	25,967.91	121.00	14,016.99		12,061.92
Do.	Sacramento	44,993.70	944.57	45.30	\$11,335.47	34,567.80
Do.	San Joaquin	3,448.92	82.48	.20		3,531.20
Colorado	White River	4,325.42		.15		4,325.27
Idaho	Dubels	20,825.92	310.61	.31	5,068.29	16,867.93
Montana	Clark Fork	5,417.71	433.67	.25		5,851.13
Do.	Crow Reservation	21,029.47	8.01	1.90		21,038.58
Do.	Lake Basin	7,021.89	79.87			7,101.76
Do.	Madison River	10,587.20	2.57	1.30		10,588.47
Do.	Marias	13,878.31	93.30	1.55	93.30	13,876.76
Nebraska	South Platte	1,913.96	963.05			2,877.01
Nevada	Walker River	12,220.29	1.53			12,221.82
New Mexico	La Plata	29,584.87	168.55	1,762.42		28,051.00
Do.	Las Vegas	5,011.41	1.48	.30		5,012.59
Do.	Urton Lake	18,831.88		125.51	914.15	17,792.22
North Dakota	Bismarck	16,709.04	26.69	14.70	2,524.42	14,196.61
Do.	Little Missouri	5,856.60	34.05	1.00		5,889.65
Oklahoma	Red River	59,272.53	1,846.64	161.77	934.50	60,022.90
Oregon	Malheur	71,862.32	542.80	227.63	1,104.93	71,072.55
Utah	Bear Lake	18,841.04	8.20	62.06		18,782.18
Do.	Utah Lake	34,044.67	9.25	4.62		34,049.30
Washington	Benton	252.74	10,914.71			11,167.45
Do.	Kititas	161.11	6,590.80			6,741.91
Do.	Palouse	76,396.75	355.72	125.83	400.00	76,216.64
Do.	Priest Rapids	6,218.98	234.38	.55		6,453.81
Wyoming	De Smet	9,053.32	2.51	39.55		9,016.28
Total		559,293.33	24,337.33	16,548.14	22,575.06	544,707.46

TABLE 15.—*Voucher transactions and net investments of the United States on town sites, Indian irrigation, and miscellaneous to June 30, 1908*

Items.	Disbursement vouchers.	Transfer vouchers received.	Collection vouchers.	Transfer vouchers issued.	Net investments.
Town sites:					
Idaho, Minidoka project...	\$2,196.73	\$4,112.92	.....	.....	\$6,309.65
Montana, Huntley project.....	2.20	908.65	\$2.00	.....	909.85
Montana, Sun River project.....	.....	759.57	.....	.....	759.57
Total.....	2,198.93	5,782.14	2.00	.....	7,979.07
Indian irrigation:					
Montana, Blackfeet project.....	7,834.32	571.25	2,641.67	\$29.50	5,734.40
Montana, Crow Reservation project.....	8.75	6.99	.....	.....	15.74
Montana, Flathead project.....	3,252.16	733.55	.....	.....	3,985.71
Washington, Yakima Reservation project.....	127.63	.....	.....	.....	127.63
Total.....	11,222.86	1,311.79	2,641.67	29.50	9,863.48
Miscellaneous:					
General expense.....	778,515.29	113,567.34	5,223.84	872,336.91	14,521.88
Closed accounts.....	729,073.93	51,416.73	394.27	780,008.39	.....
Total.....	1,507,589.22	164,984.07	5,618.11	1,652,433.30	14,521.88

TABLE 16.—*Recapitulation and verification of voucher transactions and net investments of the United States on all reclamation work to June 30, 1908*

Kind of work.	Disbursement vouchers.	Transfer vouchers received.	Collection vouchers.	Transfer vouchers issued.	Net investments.
Primary projects, Table 13.....	\$34,887,194.61	\$1,790,702.68	\$689,357.42	\$312,289.15	\$35,676,259.72
Secondary projects, Table 14.....	559,293.33	24,337.33	16,548.14	22,376.06	544,707.46
Town site operations, Table 15.....	2,198.93	5,782.14	2.00	.....	7,979.07
Indian irrigation, Table 15.....	11,222.86	1,311.79	2,641.67	29.50	9,863.48
Miscellaneous, Table 15.....	1,507,589.22	164,984.07	5,618.11	1,652,433.30	14,521.88
Total.....	36,967,498.95 (As in Table 10.)	1,987,118.01 (As in Table 12.)	714,167.34 (As in Table 11.)	1,987,118.01 (As in Table 12.)	36,253,331.61

ANALYSIS OF COLLECTIONS

The gross amount of cash collections to June 30, 1908, is shown by Table 11 to be \$714,167.34. Of this total, \$18,957.77 are for repayments to the United States because of overpayments. Only a small percentage of this, however, ever actually passed out of the possession of the Government, as about \$16,000 represents Treasury warrants and disbursing officers' checks that were not delivered, although drawn upon approved and audited vouchers, the net disbursements being thereby reduced in the same amount. The balance of \$695,209.57 represents actual cash receipts, and of this amount \$169,317.71 were for water-right charges collected under the provisions of section 4 of the reclamation act, and \$525,891.86 were from other sources of repayment to the reclamation fund under the act of March 3, 1905 (33 Stat. L., 1032). By this law the service is enabled to develop all proper revenue-producing operations connected with its work, and thereby reduce the net cost of the projects. There were received to June 30, 1908, \$160,702.51 from sales both at

public auction and in the mercantile stores operated by the service; \$38,508.46 from miscellaneous receipts, of which the greater part was for work done at the manufacturing shops on the projects, telephone tolls, and rentals of lands and buildings; \$88,772.26 from freight refunds on shipments made by contractors for use in irrigation work; \$9,000 from forfeitures by bidders who refused to enter into contracts awarded to them, and \$228,908.63 from water rentals whereby water is furnished for irrigation or other purposes before the completion and opening of projects. This latter amount, together with the water-right charges on lands on which water-right applications have been filed, makes a total of \$398,226.34 received to June 30, 1908, from water users or irrigators. Table 17 shows the sources of cash collections by calendar years, and Table 18 shows the amounts of collections of water-right charges by projects to June 30, 1908. For 1908 Table 17 includes only the amounts reported and entered in the accounts to the end of the fiscal year. Table 18 shows the amounts reported and entered in the accounts to the end of the fiscal year 1908, and in addition, the amounts actually received at the local land offices during the months of May and June, 1908, and not reported and entered before the closing of accounts for the fiscal year.

TABLE 17.—*Sources of cash collections to June 30, 1908, by calendar years*

Sources.	1903-1905.	1906.	1907.	1908 (six months).	Total.
Sales.....	\$2,453.55	\$22,441.97	\$79,650.57	\$55,126.42	\$160,702.51
Miscellaneous services.....		300.00	13,637.37	24,571.19	38,508.46
Water rentals.....			128,534.23	100,374.40	228,908.63
Freight refunds.....	693.85	16,492.42	62,943.90	8,642.96	88,772.26
Forfeitures.....	9,000.00				9,000.00
Building charges.....			126,542.44	27,442.13	154,184.57
Operation and maintenance charges.....			4,124.94	11,008.20	16,133.14
Over disbursements.....	1903 328.66 1904 1,371.08 1905 854.81	3,675.60	12,468.52	309.01	18,957.77
Total.....	1903 328.66 1904 1,371.08 1905 13,032.24	42,910.08	427,890.97	228,634.31	714,167.34

TABLE 18.—*Collections of water-right charges to June 30, 1908, by projects*

State.	Project.	Building charges.	Operation and maintenance charges.	Total.	Collections reported in July.*	Grand total.
Arizona.....	Salt River ^b	\$100,000.00		\$100,000.00		\$100,000.00
Idaho.....	Minidoka.....	3,149.43	\$1,990.12	5,049.55	956.63	5,706.18
Montana.....	Huntley.....	31,082.43	4,216.18	37,298.61	1,133.24	36,431.95
Do.....	Sun River.....	1,104.00	184.00	1,288.00	343.00	1,631.00
Nevada.....	Truckee-Carson.....	2,957.80	8,023.35	8,981.15	965.80	8,447.95
North Dakota.....	Buford-Trenton.....				423.00	423.00
Oregon.....	Umatilla.....	300.00	58.00	350.00		350.00
Washington.....	Sunnyside ^c	13,175.58		13,175.58	623.40	13,798.98
Wyoming.....	Shoshone.....	3,815.35	789.49	4,074.84	4,337.69	8,412.53
Total.....		154,184.57	15,133.14	169,317.71	7,883.76	177,201.47

*The collections reported in July consist of collections made in the fiscal year 1906, after the closing of the accounts therefor.

^b Collection through auditor's office for lands of Pima Indians.

^c Collections by fiscal agent for lands with vested water rights.

CONSOLIDATED BALANCE SHEET OF ASSETS AND LIABILITIES

Whether governmental accounting should be based on cash transactions, that is, receipts and disbursements; on accruals, that is, revenues and expenses; or on both, with the further inclusion of capital assets and liabilities, has long been a mooted and much discussed question. There has not been in the past and is not at present any commonly accepted plan. For purposes of comparison, however, the United States Bureau of the Census has been making earnest efforts to secure uniform treatment of the government accounts. In its 1907 report of "Statistics of cities having a population of over 30,000, 1905," it differentiates between the accounting for the primary financial business of governments such as that of raising and investing money and the accounting for the subsidiary business of governments. Under the latter heading, it classes accounting for industries and says that "Accounts for government industries should always be kept * * *, so as to show the condition and outcome of the business of each industry when considered as a quasi private undertaking."

Accepting this view as the one that should obtain in the accounting of the Reclamation Service, there are included in its accounts not only the cash transactions and accrued current assets and liabilities, but also the capital assets, realization upon which must under the law be deferred, and the capital liability represented by a reimbursable special fund that must ultimately be returned to the Treasury of the United States. Each project keeps its own independent accounts covering all current assets and liabilities, including cost of work as an asset to be realized upon in the future, and net investment of the United States as a liability to the Reclamation Service. A balance sheet is prepared for each project and the director's office monthly. For the entire service these balance sheets are combined into a consolidated balance sheet from which are eliminated the service debits against the projects and the project credits to the service and into which are brought the assets for cash in the Treasury and with fiscal officers and the capital liability for the appropriation, reclamation fund. Table 19 shows such a consolidated balance sheet of assets and liabilities at the close of accounts on June 30, 1908; and Table 20 shows a balance sheet of assets and liabilities for the director's office on June 30, 1908. The balance sheets of assets and liabilities for the primary projects are given in the body of this report under the project headings.

TABLE 19.—Consolidated balance sheet of assets and liabilities of the Reclamation Service on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
With Treasurer United States	\$4,084,880.67	}	\$4,977,643.68
With special fiscal agents	892,763.01		
Uncollected freight refunds	1,792.48		
Uncollected water rentals	9,564.90		
Uncollected miscellaneous rentals	8.00		
Uncollected miscellaneous	31,013.98		
Uncollected water-right building charges	251,812.84		
Uncollected water-right operation and maintenance charges	38,917.65		
Less unadjusted water-users' association work		\$59,122.49	
	333,109.83	59,122.49	273,987.34
Mercantile stores	50,459.76		
Government animals	122,269.19		
Less depreciation		17,832.35	
Equipment in use	530,797.47		
Less depreciation		3,137.95	
Storehouses	460,912.26		
Cement	239,485.19		
Iron and steel	49,080.30		
Lumber	39,317.42		
Explosives	12,534.70		
Forage	11,305.35		
Fuel	43,142.68		
Local products	27,288.78		
Unadjusted transfers	61,571.48		
	1,648,164.73	20,970.30	1,627,194.43
Building cost	36,537,285.82		
Plus adjustments	179,829.45		
Less accrued revenues		178,883.50	
Less accrued repayments		408,016.02	
	36,717,115.27	584,399.52	36,132,715.75
Operation and maintenance cost	322,112.18		
Less accrued revenues		122,311.37	
Less accrued repayments		54,032.18	
	322,112.18	176,343.55	145,768.63
Total			43,157,309.83
LIABILITIES.			
Unpaid labor	175,601.67	}	1,934,313.61
Unpaid purchases	201,305.15		
Unpaid contract estimates	370,294.93		
Unpaid contract holdbacks	584,339.49		
Unpaid freight and express	438,133.23		
Unpaid passenger fares	5,926.74		
Unpaid land agreements	150,279.61		
Unpaid miscellaneous	6,908.84		
Unredeemed coupon books	1,293.20		
Unredeemed meal tickets	231.25		
Reclamation fund (reimbursable)	41,230,975.29	7,979.07	41,222,996.22
Less expenditures on townsites (nonreimbursable)			
	41,230,975.29	7,979.07	41,222,996.22
Total			43,157,309.83

TABLE 20.—*Assets and Liabilities for director's office on June 30, 1908*

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected miscellaneous.....	\$112. 37		\$112. 37
Inventories:			
Equipment in use.....	14,053. 78		
Storehouse.....	28,476. 55		
Local products.....	3,185. 20		115,047. 83
Unadjusted transfers.....	69,332. 30		
			115,160. 20
Cost of work:			
Less adjustments.....		\$87,417. 60	
Less accrued revenues.....		44. 98	Cr. 87,462. 58
Total.....			27,697. 62
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		7,139. 00	
Unpaid purchases.....		2,606. 26	
Unpaid freight and express.....		263. 46	13,175. 74
Unpaid passenger fares.....		2,074. 65	
Unpaid miscellaneous.....		1,092. 37	
Investment of the United States:			
Disbursement vouchers.....		1,507,589. 22	
Collection vouchers.....	5,618. 11		
Transfer vouchers received.....		164,984. 07	
Transfer vouchers issued.....	1,652,433. 30		
	1,658,051. 41	1,672,573. 29	14,521. 88
Total.....			27,697. 62

EXPLANATION OF BALANCE SHEETS OF ASSETS AND LIABILITIES

The significance of the statements made in the balance sheets of assets and liabilities will be better understood after consideration of the following explanation of the items entering into the foregoing consolidated balance sheet.

The several items appear in the statement of assets and liabilities in the order in which they can or must be liquidated. Cash appears only in the consolidated statement, as it is under the control of the Reclamation Service as a whole, and payments therefrom are made by fiscal officers acting under the instructions of the director.

The accounts receivable are shown under six heads, as follows: Uncollected freight refunds, consisting of claims against railroads for contract concessions upon freight moved for contractors on irrigation work; uncollected water rentals, consisting of claims against irrigators for water furnished under rental contract; uncollected miscellaneous rentals, consisting of claims against the lessees of lands or buildings under the control of the service; uncollected miscellaneous, consisting of claims against contractors or other persons for services or materials furnished that will be deducted from current earnings by them, and against mercantile store clerks and stewards for cash collections made and reported by them but not received by fiscal agents prior to the closing of accounts for the fiscal year; uncollected water-right building charges and uncollected water-right operation and maintenance charges, consisting of claims against water-right applicants for the portions of annual installments of water-right charges that have accrued under their applications but that have not become delinquent. Both of these latter assets are subject to a reduction by the amount of work done by the water

users' associations under the plan for cooperative work and for which the associations have issued their certificates to be applied in payment of water-right charges.

The inventories are self-explanatory, but an explanation of the methods of handling these accounts will make them more easily understood. With the regular use of government animals and equipment there is a deterioration in value that should be written off from these asset accounts and included with that of cost of work. Actual depreciation is determined from time to time by surveys and appraisals or by sale, but pending such determination estimated wear and tear is credited to the respective accounts for depreciation and debited to cost of work, to be more accurately adjusted when appraisals or sales are made. Unadjusted transfers are for materials or services furnished by one project to another for which the vouchers have not yet been checked so as to warrant their entry to the proper accounts under inventories or cost of work.

Cost of work represents the outlay upon and net asset in the irrigation projects for which reimbursement will later be required from the water-right applicants. The bulk of the outlay is shown in the two accounts, building cost and operation and maintenance cost. The amount appearing in the former of these two accounts is analyzed for each project in a subsidiary account, that shows the cost of the principal physical features. A table showing an analysis of the building cost by features is given in this report under each project. In computing the current costs for such features there are certain expenses that can not be accurately determined when incurred, but that are estimated as closely as possible, subject to readjustment at a later time. The expenses that must be thus estimated do not represent a large proportion of the cost of any feature of the work, but are quite numerous and varied in kind. Most of them arise from what are known as incidental operations, such as power plants, manufacturing shops, storehouses, mess houses, mercantile stores, etc. The net gain or loss on such operations is a decrease or increase of the actual cost of the project and of the features to which they have contributed. It is usually impracticable to revise and readjust the charges made for the benefits that these incidental operations have contributed to the various features, and therefore the gains or losses are applied only to the cost of the projects as a whole. The projects derive various revenues from dealings with the general public, such as rentals of lands and buildings, payments for services performed at its manufacturing shops, rentals of irrigating water, etc. These revenues do not reduce the original cost of the features whose operations produce the revenues, but they do reduce the cost of the entire project. The net cost of a project is, therefore, obtained from the building cost, operation and maintenance cost, adjustments, and revenues. As an asset, however, such net cost is from time to time further reduced by the amount of the accrued repayments or water-right charges that become due and payable under the terms of the public notices issued in accordance with section 4 of the reclamation act. Accordingly such accrued repayments are also deducted in the statements of assets upon each project.

The accounts payable are shown under ten heads, as follows: Unpaid labor, consisting of claims in favor of employees for services performed, the greater part of which is always paid on or before the

10th of the following month; unpaid purchases, consisting of claims in favor of merchants for current unvouchered bills, most of which are paid within the following month; unpaid contract estimates and unpaid contract holdbacks, both consisting of claims in favor of contractors upon construction work, the former representing the amount now due and that will be paid as soon as settled by the auditor, and the latter representing the amount withheld until the completion of the work under the provisions of the contract; unpaid freight and express and unpaid passenger fares, consisting of claims in favor of transportation companies, both representing the estimated indebtedness for transportation furnished by carriers, the respective charges being secured for freight from delivering agents' expense bills, for express from delivering agents' verbal statements of the charges, and for passenger fares from ticket sellers' verbal statements of the fares; unpaid land agreements, consisting of claims in favor of the grantors of real property upon negotiated contracts for the acquisition of their titles and not payable until complete investigation of such titles and final determination of the exact amounts payable to the grantors; unpaid miscellaneous, consisting of claims payable in cash that do not properly come within the limits of the foregoing classes of liabilities; unredeemed coupon books and meal tickets, consisting of employees' claims that are not payable in cash except upon discharge, but for which they are entitled to receive appropriate issues at the mercantile stores and mess houses.

The capital account represents the indebtedness of the service to the United States. The reclamation fund is ultimately reimbursable and therefore a liability. The amount of the liability would be the total amount appropriated to it, except that the acts of April 16 and June 27, 1906 (34 Stat. L., 116 and 519), make the disbursements therefrom for the development of certain town sites a final expenditure that is not repayable to the service and accordingly not reimbursable to the United States. The total amount of such expenditures for town site operations to June 30, 1908, is \$7,979.07.

RIO GRANDE DAM

The act of March 4, 1907 (34 Stat. L., 1357), provided an appropriation of \$1,000,000 toward the construction of a dam in the bed of the Rio Grande for storing and delivering 60,000 acre-feet of water annually, as provided by a convention between the United States and Mexico. Tables 21, 22, 23, and 24 show the transactions under this appropriation and its condition on June 30, 1908, and are similar to the tables relating to the reclamation fund.

TABLE 21.—*Cash account, appropriation for Rio Grande dam (34 Stat. L., 1357), to June 30, 1908*

Item.	Debtor.	Creditor.
Capital account:		
Appropriation warrant No. 19, March 4, 1907.....		\$1,000,000.00
Disbursements, 222 vouchers.....	\$24,605.60	
Collections, 16 vouchers.....		68.70
Balance with Special Fiscal Agent S. T. Olsen.....	8,544.38	
Balance with Treasurer United States.....	966,918.74	
Total.....	1,000,068.70	1,000,068.70

TABLE 22.—*Balances of appropriation for Rio Grande dam in hands of United States Treasurer, June 30, 1907 and 1908^a*

Fiscal year.	Appropriation.	Withdrawal.	Balance.
1907.....	\$1,000,000.00	.....	\$1,000,000.00
1908.....		\$33,113.21	966,886.79
Total and balance per Treasury accounts, June 30, 1908.....	1,000,000.00	33,113.21	966,886.79
To reconcile with accounts of the Reclamation Service: For item in above not in Reclamation Service accounts, deduct withdrawal on direct settlement..... \$40.20			
For item not in above but in Reclamation Service accounts, add withdrawal on direct settlement.....		\$1.95	\$1.95
Total and balance per Reclamation Service accounts.....	1,000,000.00	\$3,081.26	966,918.74

^a The appropriation and balance shown in this table for the fiscal year 1907 are taken from the "Statement of balances, appropriations, and expenditures of the Government for the fiscal year ended June 30, 1907," page 56, and the withdrawals and balance shown for the fiscal year 1908 are from the "Combined statement of the receipts and disbursements for the fiscal year ended June 30, 1908," page 57.

TABLE 23.—*Advances, collections, deposits, disbursements, and balances of fiscal officers (appropriation for Rio Grande dam) to June 30, 1908*

Fiscal officer.	Advances.	Collections.	Deposits.	Disbursements.	Balances.
Duganne, C. G.....	\$6,000.00	.....	\$3,288.35	\$2,711.65	.....
Olsen, S. T.....	30,000.00	\$68.70	40.50	21,483.84	\$8,544.36
Total.....	36,000.00	68.70	3,328.85	24,195.49	8,544.36

TABLE 24.—*Disbursement and collection vouchers (appropriation for Rio Grande dam) paid and collected to June 30, 1908, by fiscal quarters*

Quarter ended—	Disbursement vouchers.		Collection vouchers.	
	Number.	Amount.	Number.	Amount.
Mar. 31, 1908.....	78	\$7,888.14	.....	.....
June 30, 1908.....	144	16,717.46	16	\$68.70
Total.....	222	24,605.60	16	68.70
Total transactions by fiscal officers.....	204	24,195.49	16	68.70
Total direct settlements by auditors of Treasury Department.....	18	410.11	.....	.....

REIMBURSEMENT TO DISBURSING AGENTS

The act of May 30, 1908 (35 Stat. L., 507), provided an appropriation of \$104.61 to reimburse certain disbursing agents for losses sustained by them on service payments made during July and August, 1906, as shown in detail in House Document 880, Sixtieth Congress, first session, page 26. The method of computing pay for services of employees on annual and monthly salaries was changed by the act of June 30, 1906 (34 Stat. L., 763), the change being effective on the following day. It was, of course, impossible to bring notice of the

change to the attention of all disbursing agents at once, and before they were notified of the change a number of payments had been made in accordance with regulations previously in force. After recovering such overpayments as far as possible, the losses sustained were reimbursed to them from this special appropriation as shown by Table 25.

TABLE 25.—*Cash account, appropriation for reimbursement of disbursing agents (35 Stat. L., 507) to June 30, 1908*

Items.	Debit.	Credit.
Capital account: Appropriation warrant No. 38, June 1, 1908.....		\$104.61
Disbursements, 1 voucher.....	\$104.61	

UNIT PRICES UNDER FORMAL SPECIFICATIONS

In the tables below are given the principal unit prices bid for work and materials and contract unit prices therefor in connection with formal specifications, proposals for which have been received by the Reclamation Service during the fiscal year ending June 30, 1908. In almost all cases contracts have been awarded to the lowest bidder, but as the contracts have been awarded on definite divisions of the work as a whole, it has frequently happened that the contract price for a particular item is higher than the lowest bid on that item.

Unit bids and contract prices

BRIDGES, HIGHWAY

State and project.	Data.	Specifica- tion number.	Feature or description.	Unit.	Quantity.	Bids per unit.		Contract price.
						Lowest.	Next.	
HEAVY BRIDGES.								
Montana-North Dakota: Lower Yellow- stone.	Nov. 15, 1907	148	Steel stringer 22½-foot span.....	Bridge.....	2	\$500.00	\$590.00	\$700
Do.....	do.....	148	Steel truss 38-foot span.....	do.....	1	1,000.00	1,010.00	1,114
Do.....	do.....	148	Steel truss 40-foot span.....	do.....	1	1,035.00	1,038.00	1,149
Do.....	do.....	148	Steel truss 50-foot span.....	do.....	1	1,233.00	1,251.00	1,423
Do.....	do.....	148	Steel truss 52-foot span.....	do.....	2	1,440.00	1,448.00	1,590
Do.....	do.....	148	Steel truss 54-foot span.....	do.....	2	1,233.00	1,244.00	1,390
Do.....	do.....	148	Steel truss 56-foot span.....	do.....	2	1,000.00	1,022.00	1,090
Do.....	do.....	148	Steel truss 58-foot span.....	do.....	1	1,667.00	1,669.00	1,760
LIGHT BRIDGES.								
Montana-North Dakota: Lower Yellow- stone.	Nov. 15, 1907	148	Steel stringer 22½-foot span.....	Bridge.....	2	337.00	375.00	337
Do.....	do.....	148	Steel stringer 20-foot span.....	do.....	2	450.00	465.00	446
Do.....	do.....	148	Steel truss 32-foot span.....	do.....	2	720.00	730.00	728
Do.....	do.....	148	Steel truss 34-foot span.....	do.....	2	766.00	781.00	774
Do.....	do.....	148	Steel truss 36-foot span.....	do.....	1	818.00	826.00	820
Do.....	do.....	148	Steel truss 38-foot span.....	do.....	2	872.00	880.00	872
Do.....	do.....	148	Steel truss 40-foot span.....	do.....	2	920.00	927.00	920
Do.....	do.....	148	Steel truss 46-foot span.....	do.....	1	1,047.00	1,069.00	1,047
Do.....	do.....	148	Steel truss 48-foot span.....	do.....	1	1,038.00	1,110.00	1,068
Do.....	do.....	148	Steel truss 50-foot span.....	do.....	1	1,140.00	1,175.00	1,140
Do.....	do.....	148	Steel truss 52-foot span.....	do.....	1	1,190.00	1,225.00	1,190
Do.....	do.....	148	Steel truss 58-foot span.....	do.....	1	1,360.00	1,400.00	1,348

CONCRETE

State and project.	Date.	Specifica- tion number.	Feature or description.	Unit.	Quantity.	Bids per unit.	Contract price.
California-Oregon: Klamath.....	Apr. 15, 1908	151	Clear Lake dam ^a	Cable yard.....	220	\$25.00	\$25.00
Do.....	do.....	151	.....do ^b.....	.....do.....	240	20.00	34.00
							Rejected.

^a Reinforced concrete in outlet tower and outlet conduit
^b Rubble concrete in dam abutment and reinforced concrete in spillway crest.

EMBANKMENT, DEPOSITED WITH SCRAPERS

California-Oregon: Klamath	Apr. 1, 1908	150	South branch canal, schedule 2....	Cubic yard.....	72,280	\$0.22	\$0.23	\$0.24
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EMBANKMENT, WET AND ROLLED IN 6-INCH LAYERS

California-Oregon: Klamath	Apr. 1, 1908	150	South branch canal, schedule 2....	Cubic yard.....	104,580	\$0.24	\$0.46	\$0.24
Do.....	Apr. 15, 1908	151	Clear Lake dikes.....	do.....	14,600	.60	.70	Rejected.

EXCAVATION, CLASS 1 (MATERIAL FLOWABLE WITH 8 HORSES)

California-Oregon: Klamath	Apr. 1, 1908	150	South branch canal, schedule 1....	Cubic yard.....	38,160	\$0.22	\$0.24	\$0.23
Do.....	do.....	150	South branch canal, schedule 3....	do.....	65,880	.21	.22	.23
Do.....	Apr. 15, 1908	151	Clear Lake dam	do.....	20,000	.40	1.00	Rejected.

EXCAVATION, CLASS 1a (CLASS 1, WET)

California-Oregon: Klamath	Apr. 15, 1908	151	Clear Lake dam	Cubic yard.....	1,500	\$1.00	\$4.00	Rejected.
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EXCAVATION, CLASS 2 (MATERIAL NOT INCLUDED IN CLASSES 1 AND 3)

California-Oregon: Klamath	Apr. 1, 1908	150	South branch canal, schedule 1....	Cubic yard.....	12,000	\$0.40	\$0.65	\$0.68
Do.....	do.....	150	South branch canal, schedule 3....	do.....	4,000	.40	.65	.68
Do.....	Apr. 15, 1908	151	Clear Lake dam	do.....	700	1.00	2.50	Rejected.

EXCAVATION, CLASS 2a (CLASS 2, WET)

California-Oregon: Klamath	Apr. 15, 1908	151	Clear Lake dam	Cubic yard.....	150	\$4.00	\$5.00	Rejected.
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EXCAVATION, CLASS 3 (SOLID ROCK)

California-Oregon: Klamath	Apr. 1, 1908	150	South branch canal, schedule 1....	Cubic yard.....	3,000	\$1.00	\$1.00	\$1.00
Do.....	do.....	150	South branch canal, schedule 3....	do.....	100	1.00	1.00	1.00
Do.....	Apr. 15, 1908	151	Clear Lake dam	do.....	24,000	2.20	4.00	Rejected.

Unit bids and contract prices—Continued
EXCAVATION, CLASS 3a (CLASS 3, WET)

State and project.	Date.	Specifica- tion number.	Feature or description.	Unit.	Quantity.	Bids per unit.		Contract price.
						Lowest.	Next.	
California-Oregon: Klamath.....	Apr. 15, 1908	151	Clear Lake dam	Cubic yard	1,500	\$5.00	\$6.00	Rejected.
HANDLING REINFORCING STEEL								
California-Oregon: Klamath.....	Apr. 15, 1908	151	Clear Lake dam	Pound	12,000	\$0.04	\$0.06	Rejected.
HANDLING GATES, GUIDES, STEMS, AND LIFTING DEVICES								
California-Oregon: Klamath.....	Apr. 15, 1908	151	Clear Lake dam	Pound	7,500	\$0.04	\$0.15	Rejected.
HANDLING STRUCTURAL STEEL								
California-Oregon: Klamath.....	Apr. 15, 1908	151	Clear Lake dam	Pound	3,000	\$0.04	\$0.10	Rejected.
ROCKPITCHING								
California-Oregon: Klamath.....	Apr. 15, 1908	151	Clear Lake dikes	Cubic yard	10,300	\$2.00	\$2.25	Rejected.

Contract prices for cement

No.	Contractor.	Date of contract.	Quantity, in barrels.	F. o. b.	Price per barrel.
212	Kansas Portland Cement Co., Independence, Kans.	Nov. 19, 1907	5,000	Independence, Kans....	\$1.00
213	Marquette Cement Co., La Salle, Ill...	Nov. 20, 1907	12,000	La Salle, Ill.....	.88
220	do.	Mar. 3, 1908	12,000	do.	.95
222	United Kansas Portland Cement Co., Iola, Kans.	Mar. 16, 1908	20,000	Iola, Gas, or Independence, Kans.	.90
223	Universal Portland Cement Co., Chicago, Ill.	do.	10,000	South Chicago, Ill.....	.95
227	Western Portland Cement Co., Yankton, S. Dak.	Mar. 20, 1908	12,000	Belle Fourche, S. Dak ..	2.18
230	Portland Cement Co., Denver, Colo....	Apr. 1, 1908	12,000	Portland, Colo.....	.98
231	Western Building Materials Co., San Francisco, Cal.	Apr. 2, 1908	7,500	Napa Junction, Cal.....	1.10

ORGANIZATION OF RECLAMATION SERVICE

GENERAL OFFICES

Hon. James Rudolph Garfield, Secretary of the Interior.

Frederick Haynes Newell, Director of the Reclamation Service, Washington,

D. C.

Arthur Powell Davis, chief engineer, Washington, D. C.

Morris Bien, supervising engineer, in charge land and legal division, Washington, D. C.

O. H. Ensign, chief electrical engineer, 626 Citizens National Bank Building, Los Angeles, Cal.

C. H. Fitch, executive officer, Washington, D. C.

A. J. Wiley, consulting engineer, Boise, Idaho.

J. H. Quinton, consulting engineer, 1016 W. Eighth street, Los Angeles, Cal.

A. E. Chandler, engineer, land and legal matters in field, Berkeley, Cal.

W. H. Code, chief engineer, Indian irrigation, available for consultation on Indian matters, 522 Bumiller Building, Los Angeles, Cal.

W. W. Follett, consulting engineer, International (Water) Boundary Commission, available for consultation on Rio Grande and Pecos matters, El Paso, Tex.

C. S. Slichter, consulting engineer, in charge investigations of movements of underground waters, 636 Francis street, Madison, Wis.

F. W. Hanna, engineer, in charge of technical section, Washington, D. C.

E. T. Perkins, transportation agent, 777 Federal Building, Chicago, Ill.

C. J. Blanchard, statistician, Washington, D. C.

J. Y. Jewett, cement expert, 207 Ellsworth Building, Chicago, Ill.

H. V. Lemenager, chief draftsman, Washington, D. C.

E. G. Paul, chief clerk, Washington, D. C.

N. E. Webster, jr., accountant, Washington, D. C.

E. G. Lind, chief fiscal officer, Washington, D. C.

C. G. Duganne, fiscal agent, Washington, D. C.

SOUTHERN DIVISION

ARIZONA, NEW MEXICO, TEXAS, UTAH, SOUTHERN CALIFORNIA

L. C. Hill, supervising engineer, office Phoenix, Ariz.; J. D. Stannard, engineer; C. S. Witbeck, examiner; G. E. Moore, fiscal agent.

Salt River project.—Chester W. Smith, engineer, Roosevelt, Ariz.; F. Teichman and W. A. Farish, engineers; S. B. Taggart, chief clerk; C. B. Barnhard, fiscal agent; Howard S. Reed, assistant engineer maintenance and operation of canals.

Yuma project.—Francis L. Sellew, project engineer, Yuma, Ariz.; L. M. Lawson, acting project engineer; Edwin D. Vincent and J. D. Fauntleroy, engineers; A. N. Kelley, chief clerk; G. A. Lindeman, fiscal agent.

Pecos Valley projects.—W. M. Reed, district engineer; B. E. Stoutemeyer, examiner, Carlsbad, N. Mex.; W. H. Frankland, chief clerk; S. T. Olsen, fiscal agent, Engle, N. Mex.

- Carlsbad project.*—L. E. Foster, maintenance and operation, Carlsbad, N. Mex.
Hondo project.—L. W. Bartholomew, maintenance and operation, Roswell, N. Mex.
Leasburg project.—Earl Patterson, maintenance and operation, Selden, N. Mex.
Rio Grande project.—Homer J. Gault and J. A. French, engineers, Engle, N. Mex.
Strawberry Valley project.—J. L. Lytel, project engineer, Provo, Utah; A. J. Hughes, chief clerk; F. W. Brose, fiscal agent.

PACIFIC DIVISION

NORTHERN CALIFORNIA, OREGON, WASHINGTON, NEVADA

- D. C. Henny, supervising engineer, office 417 Beck Building, Portland, Oreg.
 E. G. Hopson, supervising engineer, J. S. Conway, engineer.
Orland project.—J. L. Rhead, acting project engineer, Orland, Cal.; Miss M. B. Trelease, chief clerk; J. W. Spencer, fiscal agent.
Truckee-Carson project.—Maintenance and operation: T. H. Means, project engineer, Fallon, Nev.; E. W. Burr, assistant examiner; C. F. Carpenter, chief clerk; F. G. Hough, fiscal agent. Construction: D. W. Hays, engineer.
Umatilla project.—H. D. Newell, project engineer, Hermiston, Oreg.; A. N. Burch, irrigation manager; O. P. Morton, examiner; F. W. Kirksey, chief clerk and fiscal agent.
Klamath project.—D. W. Murphy, project engineer, Klamath Falls, Oreg.; William Sargeant and L. W. Hall, engineers; W. S. Wiley, assistant examiner; C. C. Hogue, chief clerk and fiscal agent; W. H. Helleman, engineer, maintenance and operation.
Okanogan project.—Ferdinand Bonstedt, project engineer, Okanogan, Wash.; Lars Bergsvik, engineer; O. P. Morton, examiner; H. A. Yates, chief clerk and fiscal agent.
Tieton project and Yakima general.—C. H. Swigart, project engineer, North Yakima, Wash.; R. B. Williamson, examiner; G. G. Mair, chief clerk; J. C. Gawler, fiscal agent.
Sunnyside project (Yakima).—Construction: Ernest McCulloh, project engineer, Sunnyside, Wash.; B. H. Davis and J. T. Burke, engineers; A. H. Gullickson, chief clerk and fiscal agent. Maintenance and operation: Walter N. Granger, irrigation manager, Zillah, Wash.; E. M. Phillebaum, chief clerk.
Wapato project.—Christian Andersen, project engineer, Toppenish, Wash.; A. S. Hayden, chief clerk.

NORTHERN DIVISION

MONTANA, NORTH DAKOTA, NORTHERN WYOMING

- H. N. Savage, supervising engineer, office Helena, Mont.; W. J. Egleston, examiner.
Blackfeet project.—G. E. Goodwin, project engineer, Family, Mont.; C. W. Donnelly, chief clerk; H. N. Bickel, fiscal agent.
Flathead project.—E. F. Tabor, project engineer, St. Ignatius, Mont.; Claude Glenn, chief clerk.
Huntley project.—C. P. Williams, engineer in charge, Huntley, Mont.; W. S. Arthur, chief clerk; H. T. Caldwell, fiscal agent.
Milk River project.—C. C. Babb, project engineer, Malta, Mont.; Joseph Wright, engineer; E. L. Hendrix, chief clerk; Esco Hamilton, fiscal agent.
Sun River project.—S. B. Robbins, project engineer, Fort Shaw, Mont.
Missouri River pumping projects.—H. A. Storrs, electrical engineer in charge, Williston, N. Dak.; G. M. Eba, chief clerk and fiscal agent.
Buford-Trenton and Williston subprojects.—G. O. Sanford, project engineer, Buford, N. Dak.
Washburn subproject.—George E. Stratton, project engineer, Washburn, N. Dak.
Lower Yellowstone project.—C. H. Paul, project engineer, Glendive, Mont.; J. W. Martin, E. C. Bebb, and G. H. Bliss, engineers; R. S. Stockton, irrigation manager; F. J. Israel, fiscal agent.
Shoshone project.—W. A. Sickler, irrigation manager, Powell, Wyo.; C. A. Peary, chief clerk; R. C. Elting, fiscal agent.
Shoshone dam.—D. W. Cole, engineer, Cody, Wyo.

CENTRAL DIVISION

COLORADO, KANSAS, OKLAHOMA, SOUTH DAKOTA, NEBRASKA, SOUTHERN WYOMING

I. W. McConnell, supervising engineer, office 429 Commonwealth Building, Denver, Colo.; J. R. Alexander, clerk in legal division.

Grand Valley project.—E. E. Sands, project engineer, Grand Junction, Colo.; H. E. Essley, chief clerk and fiscal agent.

Uncompahgre project.—C. T. Pease, project engineer, Montrose, Colo.; H. L. Daniels, engineer; E. R. Furstenfeld, chief clerk; Vail T. Barry, fiscal agent.

Garden City project.—C. E. Hogle, superintendent of operation, Deerfield, Kans.; J. J. Buck, chief clerk and fiscal agent.

North Platte project.—Andrew Weiss, project engineer, Mitchell, Nebr.; A. F. Ross, engineer; E. D. Newman, chief clerk; O. P. Burrows, fiscal agent.

Pathfinder dam.—E. H. Baldwin, engineer in charge; L. V. Branch, engineer; W. F. Costello, fiscal agent.

Belle Fourche project.—R. F. Walter, project engineer, Belle Fourche, S. Dak.; W. W. Patch and W. W. Schlecht, engineers; E. R. Mills, chief clerk; T. E. Jones, fiscal agent.

IDAHO DIVISION

W. H. Sanders, acting supervising engineer, Boise, Idaho; F. E. Weymouth, assistant supervising engineer; R. R. Clawson, fiscal agent.

Payette-Boise project.—Edward Hedden, project engineer, Boise, Idaho; F. L. Cavis, chief clerk and fiscal agent.

Minidoka project.—J. G. Camp, project engineer, Rupert, Idaho; C. A. Lyman, chief clerk and fiscal agent.

H. Doc. 1174, 60-2—4

DISCUSSION OF PROJECTS

ARIZONA

LITTLE COLORADO PROJECT

A general description of the Little Colorado project will be found in the third annual report. The expenditures on this project for the fiscal year have been for freight and services amounting to \$723.10, making a total expenditure to June 30, 1908, of \$8,717.18.

SALT RIVER PROJECT

GENERAL STATEMENT

The principal data relating to the Salt River project are summarized as follows:

- Counties: Maricopa and Gila.
- Townships: 7 N. to 2 S., Rs. 2 W. to 14 E.
- Irrigable area: 240,000 acres—gravity system, 190,000; pumping system, 50,000.
- Ownership mainly private.
- Average elevation of irrigable area: 1,000 to 1,300 feet above sea level.
- Average annual rainfall on irrigable area: 3 to 10 inches.
- Range of temperature on irrigable area: Maximum, 120°; minimum, 20°.
- Character of soil of irrigable area: Sandy loam, with clay in places.
- Duty of water: 4 acre-feet per acre per annum.
- Size of farm units: 160 acres.
- Principal products: Semitropical fruits, cereals, and alfalfa.
- Railroad stations: Globe and Phoenix, Ariz.
- Railroads: Gila Valley, Globe and Northern; Santa Fe, Prescott and Phoenix; Maricopa, Phoenix and Salt River Valley.
- Principal markets: Phoenix and other Arizona towns, Pacific coast cities, and eastern markets.
- Watershed area: 6,260 square miles.
- Average annual rainfall on watershed: 10 to 20 inches.
- Estimated annual run-off of watershed: 700,000 acre-feet, at Roosevelt dam.
- Reservoir: Area 25.5 square miles; capacity, 1,284,000 acre-feet.
- Storage dam: Type, rubble masonry arch gravity; height, 230 feet; length on top, 1,080 feet including spillways; length on bottom, 235 feet.
- Diversion dam: Type, rubble concrete weir; height, 38 feet; length, 1,100 feet.
- Canals: Length, 264 miles.
- Tunnels: Length, 9,780 feet.
- Power development: 4,400 horsepower from power canal; 3,000 horsepower from Roosevelt reservoir.
- Construction of project authorized: March 14, 1903.
- Per cent of project completed: 70.

A detailed description of the Salt River project will be found in the third annual report and general descriptions relating to the project are given in the other annual reports. Briefly, the irrigation plan of this project involves the construction of a large storage reser-

voir controlled by the Roosevelt dam on the Salt River at Roosevelt, Ariz., about 70 miles northeast of Phoenix and the Granite Reef dam on the same stream about 40 miles below the Roosevelt dam diverting water into the old Arizona canal on the right side of the river and into the highland canal on the left side of the river; the enlargement of these two canals and the consolidation of the canal systems in the Salt River Valley in the vicinity of Phoenix and Mesa, Ariz., into two systems receiving water from these two canals. A power plant is being constructed at the storage dam for generating power from stored water in the reservoir and from water delivered from a power canal, heading at a diversion dam on the Salt River about 18½ miles above the storage dam. This power will be partly sold for industrial uses and partly used for pumping water from underground sources onto high lands in the Gila Indian Reservation and in the Salt River Valley. The power canal diversion dam, the power canal, and the Granite Reef dam are completed; the Roosevelt dam, the power plant, the improvements of the Arizona canal system, and the wells for underground pumping are under construction.

ROOSEVELT DAM

On September 20, 1906, the first stone was laid in the Roosevelt dam, and on July 1, 1907, 10,198 cubic yards of masonry had been placed. From July 1, 1907, to June 30, 1908, there were laid 87,731 cubic yards of masonry, making a total at the latter date of 97,929 cubic yards. At the end of June the dam was 42 per cent completed and the south half thereof was at an elevation of 75 feet and the upstream face of the north half at an elevation of about 22 feet above low water. During the year floods delayed the laying of masonry in the dam to a greater or less extent in seven months; and delays were also caused in April by the breaking of the shaft of the water wheel, and in April and May by the construction of the penstock through the dam. In December, January, and June no delays in the work occurred.

OUTLET TUNNEL AND GATES

A provision was made by the contractor for the dam to pass the river across the north third of the dam during the time occupied by the contractor for the gates in their installation. For this purpose, water was shut out of the sluicing tunnel on January 31, 1908, and was passed over the dam till June 2, 1908, at which time the work of setting the gates had progressed sufficiently to permit the river to be again turned through the tunnel. On June 4 the tunnel was carrying the entire flow of the river, and on July 2 the work of setting the sluicing gates and operating mechanism was completed and accepted.

POWER PLANT

The temporary power plant has been furnishing power during the year, except for short periods. On April 8 the shaft on the water wheel broke and it was replaced on April 23 with a new shaft. Work on the power house for the permanent plant is practically complete and ready for the installation of the machinery, and one of the generator units with its auxiliary apparatus has been installed.

POWER CANAL

The power canal has been in constant use during the year. Two small breaks near the upper end of the canal and one near Cottonwood Creek resulted in shutting off the power for only a few hours in each instance.

CEMENT PLANT

The cement mill has been running the entire year from July 1, 1907, to June 30, 1908, except for infrequent shut downs for short periods to make necessary repairs. The total output for the year was 86,415 barrels. About 74 per cent of the output was used in the Roosevelt dam and about 21 per cent in the Granite Reef structure and the remainder was used mainly in the power house and transmission line.

GRANITE REEF DAM

Work on the Granite Reef dam has progressed in a satisfactory manner during the year. On June 30 the dam was practically completed, except the operating mechanism for the sluice gates and the house for the operating mechanism on the south side. On June 13 water was turned into the Arizona canal through the new head gates at the Granite Reef dam, the old headworks of the Arizona canal having been abandoned.

ARIZONA CANAL

The work of deepening and widening the Arizona canal was started in the fall of 1907 and nearly 2 miles of the canal had been gone over when the dredge in use had to be stopped for repairs. The dredging machinery will be mounted on a new boat and the enlargement of the canal will be continued.

GRAND CANAL

The enlargement of the grand canal was commenced in November, 1907, and pushed as rapidly as possible. To June 30 the total excavation amounted to 189,596 cubic yards. In connection with this work concrete piers, drops, turnouts, and siphons will be required.

WELL DRILLING

Work on the first well for the pumping system on the Gila River Indian Reservation was started April 20, 1908. Two wells have been completed and tested, both yielding water of fine quality. The first, 142 feet in depth, encountered water-bearing formations 52 feet in thickness and yielded 1.1 cubic feet per second. The second, 216 feet in depth, passed through 120 feet of water-bearing formation and yielded 1.6 cubic feet per second. Plans are being made to begin drilling wells in the country south of Mesa.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Salt River project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
24	Llewellyn Iron Works.....	Gates.....	\$102,000.00	\$128,735.00	July 14, 1906
32	Wolf Sachs.....	Hauling freight.....	50,000.00	59,042.40	.....
33	C. R. Eager & Co.....	Fuel oil.....	174,000.00	146,359.23	.....
35	J. M. O'Rourke & Co.....	Roosevelt dam.....	1,147,600.00	595,623.95	Oct. 10, 1908
79	General Electric Co.....	Electrical apparatus.....	32,521.00	25,630.00	Feb. 20, 1908
85	S. Morgan Smith Co.....	Water wheels.....	12,910.00	8,445.00	Sept. 10, 1908
181	U. S. Wind Engine and Pump Co.....	Transmission line supports.....	58,971.50	37,226.43	.....
184	B. F. Kierulff, jr., & Co.....	Transmission line poles.....	42,600.00	12,055.00	.....
208	General Electric Co.....	Electrical apparatus.....	36,304.00	.....	June 25, 1908
209	Wagner Electric Co.....	Transformers.....	53,215.00	23,970.00	Apr. 15, 1908
210	John A. Roebling's Sons Co.....	Copper wire.....	95,424.90	101,868.90	Apr. 12, 1908
223	United Kansas Portland Cement Co.....	Cement.....	3,216.51	3,216.51	Oct. 1, 1908

* Completed.

OPERATION

The operation of the canal systems in the Salt River Valley by the Reclamation Service began with the taking over of the north-side system May 15, 1907. The following list contains the names of the canals operated, and their extent:

Canals operated by Reclamation Service in Salt River Valley

	Miles.
Arizona canal.....	42
Arizona canal, laterals and sublaterals.....	130
Cross cut canal.....	3½
Grand cross cut canal.....	½
Joint head canal.....	1½
Salt River Valley canal.....	15
Salt River Valley canal, laterals and sublaterals.....	8½
Maricopa canal.....	16½
Maricopa canal, laterals and sublaterals.....	9
Total.....	276½

These canals were in poor condition, and the energies of the service were devoted almost exclusively to cleaning them and making such repairs to the structures, which are all wooden, as would serve to keep them in usable shape until contemplated permanent structures are constructed. Owing to the improved condition of the canals and structures the acreage under each canal has steadily increased since the beginning of operation by the service.

The expenditures for repairs of the canal system have been necessarily heavy, owing to its neglect in previous years. The dams by which water was diverted from the river were constructed of brush and rock and were consequently either very seriously damaged or completely carried away by almost every flood. These floods and the resulting damage to the diversion dams usually

occurred when water was most desired and seriously hampered all agricultural work in the valley. During the period of operation by the Reclamation Service, portions of the Arizona dam have been replaced six times and the joint head dam has been completely replaced once. The principal function of the latter dam is to divert waste and seepage water returned to the river, and it has also been instrumental in bringing to the surface a portion of the underground flow. The supply thus obtained during the past year was never below 60 second-feet. Owing to the permanency of the structure, the completion of the Granite Reef dam has already been of very great value to the irrigated lands of the Salt River Valley.

Irrigation on the Salt River project is carried on throughout every month of the year, the year being divided into two seasons, the summer season from May 15 to September 15, and the winter season from September 15 to May 15 of the year following. This method of cultivation has caused extra expense in maintenance, owing to the fact that it has been necessary to keep water in the canals constantly, as it has been impossible to take complete advantage of all the floods as they occurred on account of lack of capacity in the canals.

The main item of maintenance expense has been the keeping down of vegetation on the canal banks, consisting of Johnson grass, sour clover, and various noxious weeds. It has also been necessary to excavate a considerable amount of sand entering the canals through defects of design in the old canal headworks. The use of the Granite Reef dam, designed without such defects, now prevents the entrance of troublesome amounts of sand.

The operative force on the project consists of one engineer in charge, one inspector who has charge of the distribution of water, one gate tender, and nine ditch tenders, or zanjeros as they are locally called.

The clerical work, such as bookkeeping and cost accounts, is carried on by the accounting force along with the general project work. Records are kept in the water-service office of the amount of water delivered to each farm. These records show at any time each and every delivery, and it is fully expected that as the method of distribution develops it will be possible to reduce materially the amount of water used, as water has been used uneconomically in the past.

With the completion of the grand canal the expense attached to the operation and maintenance of the irrigation system will be greatly reduced and simplified, as then the Arizona and grand canals will deliver the water now delivered by four present existing canals.

There were 112,579 acres of land irrigated in the irrigation seasons of 1907-8, 108,535 acres of which were planted to alfalfa, sorghum, grains, and pasture, and the remainder mainly to fruits and garden products. For the season beginning May 15, 1908, there were irrigated 62,870 acres, 57,738 acres of which were planted to alfalfa, sorghum, grains, and pasture, and the remainder mainly to fruits and garden products.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected miscellaneous rentals.....	\$8. 00		
Uncollected miscellaneous.....	3, 731. 47		\$3, 739. 47
Inventories:			
Mercantile stores.....	1, 604. 83		
Government animals.....	22, 095. 80		
Less depreciation.....		\$12, 474. 06	
Equipment in use.....	20, 681. 10		
Storehouse.....	55, 068. 81		
Cement.....	13, 287. 71		
Lumber.....	70. 51		
Fuel.....	15, 812. 64		
	128, 641. 40	12, 474. 06	116, 167. 34
Cost of work:			
Building cost.....	5, 460, 028. 47		
Plus adjustments.....	\$7, 017. 75		
Less accrued revenues.....		43, 733. 84	
Less accrued repayments.....		100, 000. 00	
	5, 547, 046. 22	143, 733. 84	5, 403, 312. 38
Total.....			5, 523, 219. 19
LIABILITIES.			
Account payable:			
Unpaid labor.....		40, 293. 38	
Unpaid purchases.....		39, 275. 62	
Unpaid contract estimates.....		59, 753. 55	
Unpaid contract holdbacks.....		144, 573. 75	
Unpaid freight and express.....		31, 695. 02	
Unpaid passenger fares.....		479. 24	
Unredeemed coupon books.....		174. 00	
			316, 244. 60
Investment of the United States:			
Disbursement vouchers.....		5, 262, 589. 66	
Collection vouchers.....	211, 670. 69		
Transfer vouchers received.....		159, 210. 31	
Transfer vouchers issued.....	3, 154. 65		
	214, 825. 34	5, 421, 799. 97	5, 206, 974. 63
Total.....			5, 523, 219. 19

Total cost to June 30, 1908, distributed to principal physical features

Diversion dam.....	\$100, 552. 61
Power canal:	
Rock, earth, and concrete work.....	1, 073, 206. 75
Penstock tunnel.....	56, 514. 73
Penstock headworks.....	608. 94
Hydro-electric power plant:	
Buildings and machinery installation.....	143, 770. 61
Transformer house.....	37, 859. 63
Transmission line.....	231, 499. 72
Roosevelt Reservoir:	
Land submerged.....	67, 064. 89
Roosevelt dam and spillway:	
Rock, earth, and concrete work.....	939, 964. 85
Sluicing tunnel.....	48, 187. 23
Hydraulic gates.....	178, 752. 49
Steam power plant and electric lighting.....	81, 385. 81
Electric tramways.....	16, 203. 47
Cement mill and plant.....	155, 005. 37
Sand-crushing plant.....	25, 596. 88
Machine and repair shops.....	7, 433. 42

Granite Reef diversion dam:

Plant	\$34, 178. 87
Cableways	20, 249. 97
Dredge	19, 905. 66
Earth and concrete work, north side.....	185, 534. 51
Earth and concrete work, south side.....	102, 452. 39
Earth and concrete work, main dam.....	196, 778. 69

Distributing system:

Irrigation wells.....	13, 485. 05
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Arizona canal—

Purchase price.....	235, 168. 00
Heading at Granite Reef dam.....	44, 267. 41
Operation	3, 495. 94
Earthwork	46, 026. 77
Bridges and other structures.....	28, 920. 94
Laterals	1, 815. 56

Grand canal—

Purchase price.....	20, 488. 01
Betterments	65, 737. 22

Maricopa canal—

Purchase price.....	\$26, 265. 99
Less	8, 420. 32
	17, 845. 67
Betterments	2, 953. 99

Salt River Valley canal—

Purchase price.....	16, 509. 00
Less	11, 369. 85
	5, 139. 15
Betterments	1, 444. 07

Highland, appropriation, and consolidated canals.....	651. 84
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South canal, earthwork.....	13, 662. 22
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Power and water-power canals.....	25, 088. 69
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Roads (building and maintenance of).....	501, 186. 27
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Real estate (rights and property).....	44, 280. 45
--	-------------

Buildings:

Offices, dormitories, warehouses, etc.....	80, 340. 22
--	-------------

Waterworks and fire protection.....	11, 789. 59
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Telephone system.....	53, 889. 41
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Irrigable lands (farm unit subdivision).....	17, 665. 14
--	-------------

Investigations and underground water supply.....	18, 577. 77
--	-------------

Examination of project as a whole.....	188, 411. 21
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Administration of project as a whole.....	312, 361. 74
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Cost ledger inventories.....	2, 629. 30
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Total building cost as per debit in cost of work in state- ment of assets and liabilities.....	5, 460, 028. 47
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SAN CARLOS PROJECT

A detailed description of the San Carlos project will be found in the first annual report. The expenditures on this project for the fiscal year have been for services, freight, supplies, and steam gaging, amounting to \$844.80, making a total expenditure to June 30, 1908, of \$24,509.51.

ARIZONA-CALIFORNIA
COLORADO RIVER PROJECTS

GENERAL STATEMENT

The Colorado River projects consist of a number of possible irrigation developments on the lower Colorado River in Arizona and California, the principal of which are the Blythe, Parker, and Needles. Descriptions of the Colorado River projects will be found in the first and second annual reports. The lands of these projects are to be irrigated with water from the Colorado River, but there is an insufficient normal water supply in the river for the purpose of their proper irrigation. The success of the projects therefore depends on the storage of water in the drainage areas of the Grand and Green River systems, forming the Colorado River.

A description of the storage reservoirs investigated on the Grand River and its tributaries will be found in the fourth annual report. During 1904 investigations were carried on in connection with certain possible reservoirs on the Green River. A reconnaissance survey of Green River between Green River, Wyo., and Ouray, Utah, was made for the purpose of determining the most feasible location for a storage reservoir that would control the entire flow of the river, and special investigations were made in connection with the Flaming Gorge reservoir site, Wyoming and Utah; the Browns Park reservoir site, Utah and Colorado; the Island Park reservoir site, Utah; the Narrows reservoir site, Utah; the Ouray reservoir site, Utah. No feasible dam sites were found in connection with the last two of these reservoir sites.

FLAMING GORGE AND ISLAND PARK RESERVOIR SITES

The Flaming Gorge reservoir site is located about 40 miles south of Green River, Wyo. The fall of the river above Henrys Fork is quite uniform and light and there are no rapids in the river between Henrys Fork and Green River. The capacity of the reservoir with a 100-foot dam is between 300,000 and 350,000 acre-feet. This capacity is not sufficient to control the flow of the river at the dam. The dam site is located in Flaming Gorge, about $1\frac{1}{2}$ miles below Henrys Fork. The length of the dam at the crest would be about 800 feet and at the present low-water surface about 380 feet. The rock at the dam site consists of hard Uinta seamy sandstone. The stratification is irregular, especially on the right bank, which is a perfect antichlinal flexure. The land covered by the reservoir site is chiefly unimproved.

The Island Park reservoir site is located in Utah, about 22 miles northeast of Vernal. The capacity of the reservoir with a 100-foot dam is between 130,000 and 150,000 acre-feet. The dam site is located in Split Mountain Canyon and a dam 100 feet high would be 700 feet long at the crest and about 350 feet long at the present low-water surface. The rock at the dam site consists of hard, seamy sandstone with irregular stratification. This reservoir might be utilized for storing the flow of Bear River, thus serving as an auxiliary storage to the Browns Park reservoir in caring for the flow from this source coming into Green River below Browns Park.

BROWNS PARK RESERVOIR SITE

Browns Park reservoir site is located in Utah and Colorado, about 55 miles south of Rock Springs, Wyo. The dam site is located in the upper end of Ladon Canyon. The rock at the dam site consists of hard Uinta sandstone and is uniformly bedded. The reservoir would control the flow of the entire river except in the wettest years, and the site is the most feasible of those investigated by the Reclamation Service on Green River. The land covered by the reservoir site consists of winter pasture lands.

The areas and the capacities of the reservoir and elevations of water surface as computed from a plane table survey map for various heights of dam are as follows:

Area and capacity of Browns Park reservoir site

Height of dam.	Elevation water surface.	Area.	Total capacity.
<i>Feet.</i>	<i>Feet.</i>	<i>Acres.</i>	<i>Acro-feet.</i>
0	5,180	0	0
10	5,190	312	1,560
20	5,200	2,549	15,860
30	5,210	5,993	58,570
40	5,220	7,447	125,770
50	5,230	8,161	203,810
60	5,240	8,839	288,810
70	5,250	9,657	381,290
80	5,260	10,413	461,640
90	5,270	11,247	589,940
100	5,280	12,279	707,570
110	5,290	13,403	835,980
120	5,300	14,573	975,860
130	5,310	15,619	1,126,820
140	5,320	16,803	1,288,930
150	5,330	18,157	1,463,730
160	5,340	19,315	1,651,090
170	5,350	20,515	1,850,240
180	5,360	21,773	2,061,680
190	5,370	22,927	2,285,180
200	5,380	.....	2,520,000

* Approximate.

During the past season borings at the dam site have been in progress for the purpose of determining the distance to bed rock.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Cost of work:			
Building cost.....	\$25,384.84		\$25,384.84
LIABILITIES.			
Investment of the United States:			
Disbursement vouchers.....		\$24,114.71	
Collection vouchers.....	707.33		
Transfer vouchers received.....		2,201.76	
Transfer vouchers issued.....	224.30		
	931.63	26,316.47	
Total.....			25,384.84

Total cost to June 30, 1908, distributed to principal physical features

Preliminary examination and surveys.....	\$25,384.84
Total building cost as per debit in cost of work in statement of assets and liabilities.....	25,384.84

YUMA PROJECT

GENERAL STATEMENT

The principal data relating to the Yuma project are summarized as follows:

Counties: Yuma, Ariz., and Imperial, Cal.
 Townships: 3 to 13 S., Rs. 21 to 25 W., G. and S. R. M.; 9 to 17 S., Rs. 16 to 23 E., S. B. M.
 Irrigable area: 79,000 acres—gravity system, 73,000; pumping system, 6,000.
 Ownership, public, 25 per cent (including Indian lands); private, 75 per cent.
 Average elevation of irrigable area: 100 to 300 feet above sea level.
 Average annual rainfall on irrigable area: $2\frac{1}{2}$ inches.
 Range of temperature on irrigable area: Maximum, 118° ; minimum, 22° .
 Character of soil of irrigable area: Rich alluvium.
 Duty of water: $5\frac{1}{2}$ acre-feet per acre per annum.
 Principal products: Semitropical fruits and alfalfa.
 Railroad station: Yuma, Ariz.
 Railroad: Southern Pacific.
 Principal markets: Los Angeles and San Francisco, Cal., and Arizona towns.
 Watershed area: 200,000 square miles.
 Estimated annual run-off of watershed: 11,000,000 acre-feet.
 Reservoir: Area, 10 square miles; capacity, 25,650 acre-feet.
 Storage dam: Type, Indian weir; height, 19 feet; length, 4,780 feet.
 Diversion dam: Storage dam used for diversion.
 Main canals: Length, 19 miles—Arizona side, 6 miles; California side, 13 miles.
 Laterals: Length, 138 miles.
 Dikes: Length, $73\frac{1}{2}$ miles.
 Construction of project authorized: May 10, 1904.
 Per cent of project completed: 51.

A detailed description of the Yuma project will be found in the third annual report, and general descriptions relating to the project are given in the second, fourth, fifth, and sixth annual reports. Briefly, the present irrigation plan of this project involves the construction of the Laguna dam across the Colorado River about 10 miles northeast of Yuma, Ariz., for the purpose of diverting water

into two canal systems, one on each side of the river, covering lands in the Colorado and Gila River valleys in the vicinity of Yuma. The canal system diverting water on the California side covers all irrigable lands on that side of the Colorado River, including those on the Yuma Indian Reservation, crosses the Colorado River at Yuma in an inverted siphon, and covers all the irrigable lands in the Colorado River Valley below Yuma on the east side of the river. The canal system diverting water on the Arizona side waters all lands in the Colorado and Gila River valleys lying east of the Colorado River and north of the Gila River. At the terminus of the gravity canal a pumping plant raises water through a small lift on to 6,000 acres of land. The lands adjacent to the Gila and Colorado rivers are protected from overflow of these streams by means of dikes. The dikes are completed, and the Laguna dam, the diversion canal headworks, and the Indian Reservation canals are under construction.

LAGUNA DAM AND HEADWORKS

A complete description, with illustrations, of the Laguna dam and headworks is given in the third annual report, page 193. The only material change in the plans since that date is the changing of the main headworks from the Arizona to the California side of the river as noted above. On January 24, 1907, the contract for this work was assumed by the United States, by the mutual consent of the United States and the contractor, and since that date has been conducted by forces working under the direct supervision of the engineers of the Reclamation Service. The amount of work performed by the contractor was 34 per cent of the estimated total. Of the remaining work the United States had accomplished on June 30, 1908, 43 per cent of the whole, making the total completed at that date 77 per cent. During the year under review the Arizona portion of the dam has been extended into the river, until but about 700 feet of the main structure remains to be built; the sluiceways are so far advanced that water can be turned through them early in the coming low-water season, assuring the completion of the dam and headworks well in advance of the annual flood of 1909.

Work done on the Laguna dam to June 30, 1908

Items.	Con- tractor-	United States Recla- mation Service.	Total.
Material excavated, class 1.....cubic yards..	136,894	206,267	343,161
Material excavated, class 2.....do.....	232,184	104,851	337,035
Rock placed in dam.....do.....	114,321	148,435	262,756
Rock pavement laid.....square yards.....	5,391	.....	5,391
Concrete pavement laid.....cubic yards.....	952	24,248	25,200
Sheet piling, furnished and driven.....linear feet.....	50,003	22,379	72,382
Concrete core walls.....cubic yards.....	10,010	10,017	20,027
Foundation for lower wall.....linear feet.....	.....	1,879	1,879

DIKES (LEVEES)

During the fiscal year ending June 30, 1908, the levees in the lower valley have been extended to a point 25 miles below Yuma, nearly to the Mexican boundary, and the levee from Yuma to Laguna dam through the Yuma Reservation was completed. This levee has a length somewhat in excess of 13 miles and carries a railroad which is

now under operation as a branch of the Southern Pacific. All freight for the dam is now handled over this branch, and the work of construction is thereby greatly facilitated. All levee work has been done by force account with scraper teams, comprising one camp of government stock and several camps of stock hired for the purpose from farmers and others.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Yuma project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
71	Pacific Portland Cement Co.	Cement.	\$54,075.15	\$11,384.75	.....
98	J. G. White & Co.	Sluice gates.	65,900.00	39,000.00	Jan. 19, 1908
214	Featherstone Foundry and Machine Co.	Wheel pump.	3,978.01	3,402.99	Apr. 24, 1908
221	Fairbanks, Morse & Co.	Gas engines.	5,050.00	5,025.50	May 15, 1908
222	Western American Gas Co.	Gas plant.	3,000.00	.....	July 13, 1908
223	United Kansas Portland Cement Co.	Cement.	14,493.91	6,869.61	Oct. 1, 1908
226	General Electric Co.	Electrical apparatus.	2,415.00	.....	July 3, 1908
241	Northern Electrical Manufacturing Co.	Controlling apparatus for gates.	4,628.60	.....	Aug. 23, 1908

α Completed.

OPERATION

Pending the delivery of water from Laguna dam, the situation in the Yuma Valley has been greatly relieved by the purchase and operation by the Reclamation Service of the Colorado River Pumping and Irrigation Company's plant and the Farmers' Gravity canal. Negotiations for the purchase of the Ives heading, pumps, and ditches are so far advanced as to warrant the service taking possession and having the use of the canals in extending its system through the valley.

The steam pumping plant, with a capacity of 40 second-feet, has been operated continuously since August, 1907, serving approximately 3,800 acres. A new concrete heading for the Farmers' Gravity canal, capable of diverting over 100 second-feet, was constructed during the spring of 1908, and during the summer overflow of the Colorado River supplied water to the canal, greatly increasing the acreage of irrigated land. The installation of a newly designed scoop wheel at this heading in a few months will further increase the acreage and furnish a continuous discharge capable of irrigating 10,000 acres. The purchased canals have been repaired and are now in serviceable condition.

DEVELOPMENT

Landowners are gradually learning the adaptability of the soil to various crops. Alfalfa, maize, sorghum, corn, and garden crops have been cultivated with success and through the experimental station of the Agricultural Department located here other paying products are being introduced. Land values have increased considerably during the past year.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected water rentals	\$2,923. 50		\$7,630. 72
Uncollected miscellaneous	4,707. 22		
Inventories:			
Mercantile stores	24,032. 16		170,040. 15
Government animals	7,420. 17		
Storehouse	110,069. 59		
Cement	4,439. 76		
Lumber	5,238. 91		
Forage	1,569. 18		
Fuel	17,240. 38		
Cost of work:			
Building cost	2,329,335. 61		2,351,388. 25
Plus adjustments	30,318. 59		
Less accrued revenues		\$8,265. 95	
	2,359,654. 20	8,265. 95	2,351,388. 25
Total			2,529,058. 12
LIABILITIES.			
Accounts payable:			
Unpaid labor		16,940. 80	112,444. 96
Unpaid purchases		29,328. 65	
Unpaid contract holdbacks		1,675. 17	
Unpaid freight and express		63,881. 34	
Unpaid passenger fares		209. 55	
Unredeemed coupon books		409. 45	
Investment of the United States:			
Disbursement vouchers		2,411,287. 47	2,416,614. 61
Collection vouchers	38,945. 62		
Transfer vouchers received		45,208. 50	
Transfer vouchers issued	936. 19		
	39,881. 81	2,456,495. 97	2,416,614. 61
Total			2,529,058. 12

Total cost to June 30, 1908, distributed to principal physical features

Laguna dam:	
Earth, rock, and concrete work	\$1,168,968. 62
Sluice and regulator works:	
Earthwork	37,470. 69
Structures	13,763. 96
Dikes (levees):	
Reservation dikes	238,147. 43
Yuma dikes	201,358. 06
Gila dikes	63,053. 47
Distributing system:	
Reservation canal	9,829. 17
Yuma canal	27,022. 58
Gravity pumping plant and canal	41,831. 36
Buildings and plant	216,076. 99
Real estate (rights and property)	41,074. 68
Examination of project as a whole and examinations previous to selection of project	271,238. 60

Total building cost as per debit in cost of work in statement of assets and liabilities

2,329,335. 61

CALIFORNIA
ORLAND PROJECT

GENERAL STATEMENT

The principal data relating to the Orland project are summarized as follows:

Counties: Glenn and Tehoma.
Townships: 21 to 23 N., Rs. 2 to 4 W.
Irrigable area: 14,000 acres. Ownership, private.
Average elevation of irrigable area: 175 to 380 feet above sea level.
Average annual rainfall on irrigable area: 17 inches.
Range of temperature on irrigable area: Maximum, 120°; minimum, 24°.
Character of soil of irrigable area: Gravelly loam.
Duty of water: 3 to 3½ acre-feet per acre per annum.
Size of farm units: 40 acres.
Principal products: Cereals, vegetables, alfalfa, fruits, and nuts, including almonds and English walnuts.
Railroad station: Orland, Cal.
Railroad: Southern Pacific.
Principal markets: San Francisco and Sacramento, Cal.
Watershed area: 660 square miles.
Average annual rainfall on watershed: 33 inches.
Estimated annual run-off of watershed: 690,000 acre-feet.
Reservoir: Area, 1,900 acres; capacity, 45,000 acre-feet.
Storage dam: Type, concrete masonry, gravity section; height, 127 feet from bedrock; length, bottom 40 feet, top 330 feet.
Diversion dam: Type, sheet piling capped with concrete; length, 900 feet.
Main canals: Length, 20 miles.
Laterals: Length, 50 miles.
Construction of project authorized: October 5, 1907.
Per cent of project completed: Preliminary work.

A detailed description of the Orland project will be found in the sixth annual report. Briefly, the irrigation plan of this project contemplates the construction of a storage reservoir controlled by the East Park dam on Stony Creek at a point about 40 miles above Orland, Cal., and a diversion dam situated at Miller Buttes for diverting water into two canals, one on each side of the creek, covering lands in the vicinity of Orland.

To facilitate the work of construction on the project a 10-acre tract of land has been purchased in the town of Orland and the erection of an office building, a cottage, a storehouse, and a barn has been begun. Wells have been bored to provide water for the buildings as well as to irrigate the tract until water can be supplied from the canal system. Options have been taken on lands in the East Park reservoir, the aggregate purchase price of which amounts to \$72,460. The purchase of a part of these lands to the amount of \$17,690 has been consummated and the remainder will be purchased as soon as the titles thereto can be perfected.

EAST PARK DAM, SPILLWAY, AND DIKES

Plans and specifications have been prepared for the construction of East Park dam, spillway, and dikes, and proposals therefor will be opened August 27, 1908. It is proposed to complete these structures in June, 1910.

PURCHASE OF CANAL SYSTEMS

The United States has contracted with the Stony Creek Irrigation Company to purchase in July of 1909, for the sum of \$25,000, a small canal on the south side of Stony Creek. It is proposed to enlarge and extend this canal to cover all of the lands to be irrigated on the south side of Stony Creek. New headworks will be constructed at Miller Buttes on Stony Creek and a canal about 1,000 feet in length will be built to connect with the head of the present canal. The United States is also under contract to purchase the Lemon Home canal in July of 1909 for \$15,250. It covers the lands to be irrigated on the north side of Stony Creek. This canal is well located and will be used as a main canal for the new system.

IRRIGABLE LAND

The land to be irrigated under the Orland project has been cultivated from early days in the growth of wheat and barley without fertilization or rotation of crops and is consequently exhausted. It has been demonstrated, however, that its fertility can be renewed and that it will then produce, when irrigated, an excellent quality of alfalfa, citrus fruits, and nuts. It is estimated that from 300 to 400 families can find homes on these lands.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	D ebits.	Credits.	Amounts.
ASSETS.			
Inventories:			
Government animals.....	\$250. 00		\$3,477. 70
Equipment in use.....	3,227. 70		
Cost of work:			
Building cost.....	137,007. 47		138,608. 76
Plus adjustments.....	1,601. 29		
Total.....			142,086. 46
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		\$2. 00	95,609. 11
Unpaid purchases.....		478. 98	
Unpaid freight and express.....		89. 46	
Unpaid passenger fares.....		18. 69	
Unpaid land agreements.....		95,080. 00	
Investment of the United States:			
Disbursement vouchers.....		34,601. 48	46,417. 35
Collection vouchers.....	.27	11,868. 94	
Transfer vouchers received.....			
Transfer vouchers issued.....	42. 80		
Total.....	43. 07	46,460. 42	142,086. 46

Total cost to June 30, 1908, distributed to principal physical features

East Park storage reservoir:	
Lands submerged	\$71, 051. 75
Surveys	7. 18
Stoneyford reservoir	128. 28
Millsite reservoir	328. 21
Diversion system:	
Main canals—	
North canal—	
Lands and rights of way	25, 015. 40
Surveys	7. 10
South canal—	
Lands and rights of way	15, 994. 65
Surveys	156. 20
Buildings (offices, dormitories, warehouses, etc.)	478. 53
Examination of project as a whole	5, 898. 25
Administration of project as a whole	17, 745. 48
Cost ledger inventories	196. 44
<hr/>	
Total building cost as per debit in cost of work in statement of assets and liabilities	137, 007. 47

OWENS VALLEY PROJECT

A detailed description of the Owens Valley project will be found in the third annual report. No work has been done on this project this year, the project having been abandoned for the use of the city of Los Angeles in accordance with the act of Congress approved June 30, 1906. (34 Stat. L., 801.) The gross expenditures to the end of the fiscal year have been \$26,061.92, of which \$14,016.99 have been reimbursed to the project by the city of Los Angeles, leaving a total net expenditure on the project to June 30, 1908, of \$12,061.92.

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CALIFORNIA-OREGON

KLAMATH PROJECT

GENERAL STATEMENT

The principal data relating to the Klamath project are summarized as follows:

Counties: Klamath, Oreg.; Siskiyou and Modoc, Cal.
Townships: 38 to 40 S., Rs. 8 to 14 $\frac{1}{2}$ E., W. M.; 46 to 48 N., Rs. 1 W. to 8 E., M. D. M.
Irrigable area: 181,000 acres. Ownership, public, 25 per cent; private, 75 per cent.
Average elevation of irrigable area: 4,100 feet above sea level.
Average annual rainfall on irrigable area: 15 inches.
Range of temperature on irrigable area: Maximum, 105°; minimum, 0°.
Character of soil of irrigable area: Decomposed basalt and rich lake bottoms
Duty of water: 1 $\frac{1}{2}$ acre-feet per acre per annum.
Size of farm units: Tentatively fixed at 160 acres.
Principal products: Alfalfa, hay, cereals, vegetables, and fruit.
Railroad station: Dorris, California.
Railroads: California Northeastern and Southern Pacific.
Principal markets: San Francisco, Cal., and Portland, Oreg.
Watershed area: Upper Klamath Lake, 3,100 square miles; Clear Lake reservoir, 600 square miles.
Average annual rainfall on watershed: 20 inches.
Estimated annual run-off of Klamath watershed: 1,720,000 acre-feet.
Reservoirs: Clear Lake, area, 25,000 acres; capacity, 460,000 acre-feet. Upper Klamath Lake, capacity, 60,000 acre-feet.
Storage dam: Clear Lake, type, earth and rock fill; height, 33 feet; length, 940 feet.
Dike: Type, earth and rock fill; length, 4,000 feet.
Diversion dam: Lost River, type, reenforced concrete; details not designed.
Main canals: Length, 23 $\frac{1}{2}$ miles in operation.
Laterals: Length, 47 miles in operation.
Tunnel: Length, 3,300 feet in one tunnel.
Construction of project authorized: May 17, 1905.
Per cent of project completed: 32.

A detailed description of the Klamath project will be found in the fifth annual report, and general descriptions relating to the project are given in the second, third, fourth, and sixth annual reports. Briefly, the irrigation plan of this project involves the construction of two canals, one on each side of the outlet river, diverting water from Upper Klamath Lake near Klamath Falls, Oreg.; an outlet for Lower Klamath Lake at Keno, Oreg., for reducing the water level in that lake; a storage dam on Lost River, controlling the outlet to Clear Lake reservoir; a diversion dam on Lost River at a point about 12 miles below the storage dam; and two canals heading at this diversion dam, one on each side of Lost River. The Keno canal, diverting water from the right bank of Upper Klamath Lake, covers lands in the Klamath River Valley and furnishes a water supply for

power purposes. The canal diverting from the left bank of the Upper Klamath Lake waters lands in the lower valley of Lost River, in Klamath Valley and in the bed of Tule Lake. The canals diverting water from Lost River water lands in the upper portion of the Lost River Valley. Inasmuch as Lost River drains into Tule Lake, the controlling of the flow of this river by the construction of the Clear Lake reservoir will dry up part of Tule Lake, making the irrigation of a portion of its bed possible. The construction of the canals diverting water from Upper Klamath Lake is in progress. The completion of this canal system, the draining of Lower Klamath Lake, the construction of the Clear Lake dam and the diverting dam on Lost River and the related canal system remain yet to be done.

KENO AND EAST BRANCH CANALS

Since the date of the last annual report work on the construction of the Keno and east branch canals has been carried on by force account. Construction on the east branch canal, however, was discontinued in the latter part of July, 1907. On account of existing labor conditions, only a limited force of men could be gotten, and it was deemed expedient to concentrate all this force on the work of constructing the Keno canal. The excavation on the first unit of this canal was completed in June, 1908. This work involved the excavation of 44,912 cubic yards of class 1 material, 20,296 cubic yards of class 2 material, and 19,640 cubic yards of class 3 material.

SOUTH BRANCH CANAL

On April 1, 1908, proposals were opened for the construction of a portion of the south branch canal, involving approximately 125,000 cubic yards of excavation and 175,000 cubic yards of embankment. A contract for construction was entered into on May 8. Work was begun May 13, and satisfactory progress has been made. On June 30, 30 per cent of the work had been completed. On May 18 a contract was let for the construction of south branch canal flume, and on June 30 this structure was 10 per cent completed.

SOUTH BRANCH CANAL LATERAL SYSTEM

During the spring of 1908 plans were prepared for the construction of a lateral system under the south branch canal. Authority was granted for the construction of this work by force account and work thereon was initiated in June. The work involves the construction of about 36 miles of laterals, providing for the irrigation of approximately 10,000 acres, and it is anticipated that it will be completed for use for the irrigation season of 1909.

CLEAR LAKE DAM AND DIKES

On April 15, 1908, proposals were opened for the construction of the Clear Lake dam and dikes. This work involves the handling of about 79,000 cubic yards of material, approximately one-half of which is rock and the remainder earth. All proposals were considered unsatisfactory and were rejected.

INVESTIGATIONS

General investigations of the engineering features of the project have been continued throughout the year for the purposes of determining the best method of draining the marsh lands proposed to be reclaimed by this method and completing the estimates of the cost of building the project. In connection with the marsh lands, plans have been completed and work started on an experimental farm thereon. This experimental farm contains about 120 acres and is located on the proposed line of the California Northeastern Railroad. It is the intention to separate the farm from the surrounding marshes by means of levees and to drain it by pumping.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Klamath project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
71	Pacific Portland Cement Co.....	Cement.....	\$1. 20	\$1. 20	.....
87	Mason, Davis & Co.....	Main canal.....	377, 830. 00	\$75, 113. 59	July 20, 1907
91	International Contract Co.....	Bridges.....	6, 828. 00	\$6, 180. 72	Sept. 5, 1907
140	Pacific Portland Cement Co.....	Cement.....	1. 20	1. 20	June 1, 1908
242	Maney Brothers & Co.....	South branch canal..	78, 996. 70	23, 729. 55	Nov. 15, 1908

* Completed.

SETTLEMENT

The land in the Klamath basin is nearly all in private ownership and held generally in large tracts. The entire basin covers about 200,000 acres, about 50,000 of which are tule marshes. Two small private irrigation systems have been operated in the basin for more than ten years. The uplands have been used for farming under irrigation, dry-land farming, and grazing. Development under the past conditions has been slow owing to the character of agriculture practiced. Much land was necessary for handling cattle and horses, and land subdivision under such conditions progressed very little.

The population of the district a few years ago was but a few hundred, and has grown during the past four years to about 3,500 people.

Settlement on the farm lands is progressing slowly. Early in the development of the project by the United States, a material concentration of land into larger holdings took place at rather high prices. Since that time the conservative policy of development of the lands for irrigation, the isolated condition of the country, and the generally reasonable prices of good land over the West, have influenced the sale of Klamath lands owned in large tracts. There are at present about 130 farm units of 160 acres each under ditches, and the number of these by the opening of the 1909 season will be about 200. A number of the farms cultivated are in 80-acre tracts; hence the settlement possibilities are materially greater than the above figures would indicate.

For the development of the project there are needed the rapid putting under ditches of double the present acreage, a material cheapening of the prices of land per acre, and the early connection of the district with outside points by railroads.

PRESENT IRRIGATION SYSTEM

To the present time, through the purchase of old canal systems and new construction, approximately 20,500 acres of irrigable land have been brought under canals ready for irrigation and settlement. For the season of 1907 an area of 8,900 acres was irrigated under an annual water charge of \$1.50 per acre. Of the land under ditches for that season, about 11,600 acres did not subscribe for water, the land being either undeveloped or cultivated under a system of dry farming. For the irrigation season of 1908 to June 30 practically the same conditions existed. On June 30 water was being furnished to 100 water users, with the probability of an increase in the number of users to 120 before the close of the season.

At present water for irrigation is distributed to two districts about 20 miles apart. The Klamath district, lying near the town of Klamath Falls, Oreg., is supplied with water from the main project canal, having a capacity of 1,500 second-feet. In this district about 5,500 acres of land are being watered. The system so far constructed in this district consists of about 13 miles of main canal and 36 miles of main laterals.

The second district irrigated lies near the town of Merrill, Oreg., and is supplied with water from Lower Klamath Lake through a canal of about 80-second-foot capacity. This system consists of approximately 12 miles of main canal and 10 miles of main laterals. The acreage irrigated near Merrill during the season of 1907 was approximately 3,400 acres, and for the season of 1908 about 4,000 acres.

OPERATION AND MAINTENANCE

The irrigation season opens on the project generally about the middle of May. In exceptionally dry years an earlier date is necessary. For the season of 1907 delivery of water began in the Klamath district the last of May and in the Merrill district on May 16. For the season of 1908 delivery of water began in both districts on May 1. Irrigation usually closes about September of each year. So far the soil and climate conditions have indicated a water requirement for crops of about 2 acre-feet per acre per season.

The principal crops irrigated at the present time are alfalfa, grain, and pasture. The usual practice in the past has been to irrigate alfalfa twice, grain once, and pasture land from one to three times. There is a tendency, as experience is acquired, to increase the number of irrigations of alfalfa to three during a season. Two hay crops of alfalfa are usually cut in each season, and the third growth is pastured with range stock, although this is not considered the most desirable plan.

The present temporary methods employed to supply water necessitate the charging of the cost of repairs and distribution to the building charge of the project. Owing to this condition, it is impossible at present to ascertain accurately the cost of operation and maintenance. Approximate summaries of irrigation operations and the costs thereof on the project indicate for the fiscal year an expenditure

of \$0.32 per acre for the regulation of the distribution of water and \$1.21 per acre for repairs to the system handled. The system handled consisted in large part of old canals in a very poor state of repair, both as to earth banks and structures. During the year practically 10 miles of main canal and 15 miles of laterals were repaired throughout as to earth work, and a total of about 75 structures were built. To such repairs were also added the extra expenses necessary in the priming and maintenance of new canals in the light, ashy soils of the project.

The regular force employed in the operation work on the 70 miles of canals and laterals consisted of one engineer in charge, one assistant engineer, one head-gate tender, three ditch riders, one patrolman a portion of the season, two repair men throughout the season, four work horses, and one driving team. A considerable amount of canal repair work was done in the fall and spring seasons under small contracts with farmers and by force account.

AGRICULTURAL POSSIBILITIES

The upland soils of the project are composed in the main of disintegrated lava. These soils are sands and sandy loams. Their fertility and lasting quality need not be questioned. Some of the soils in the trough of the valley grade lower in value than those on the slopes, though the land in general is suited to agricultural purposes. The marsh soils are composed of volcanic material and diatomous sediments heavily charged with organic matter. These soils, when reclaimed, should be adapted to special lines of production, as well as general cultivation. The development of variety of crops is perhaps more related to climatic influences in the district than to any additional soil requirement. The project lands are safely adapted to general farming, stock raising, and dairying, and additionally the development of special crops, including fruit, is possible and probable. The country is unsurpassed for the production of fine horses, mules, cattle, hogs, sheep, and all common farm stock.

CROPS AT PRESENT GROWN

The following is presented as showing the crop returns for the season of 1907. The statistics are gotten from personal investigation and cover returns from 90 per cent of the land irrigated, and the values given are based on local prices.

Crops grown in Klamath basin

Crop.	Acres.	Irrigated area.	Average yield per acre.	Total values	Average value per acre.
		<i>Per cent.</i>	<i>Tons.</i>		
Alfalfa.....	4,341	49.7	2.68	\$37,464	\$20.15
Timothy.....	14	.2	3.21	450	32.14
Barley hay.....	17	.2	1.00	136	8.00
Wheat hay.....	40	.5	1.25	400	10.00
Oat hay.....	129	1.4	1.70	1,980	15.34
Rye hay.....	53	.6	2.09	560	10.57
			<i>Bushels.</i>		
Barley.....	1,786	20.5	33.60	31,931	17.88
Oats.....	351	4	39.20	5,506	15.69
Wheat.....	177	2	26.40	2,800	15.82
Potatoes.....	30	.8	200.00	5,489	149.63
Pasturage.....	1,714	19.7	.....	10,284	6.00
Orchards and gardens.....	76	.9	.....	760	10.00
Total.....	8,728	.....	.....	147,760	16.93

The best yields of alfalfa showed 5 tons per acre, of barley 90 bushels per acre, and of oats 60 bushels per acre. The pasturage obtained from the alfalfa lands for range stock in the fall is not included in the estimate for pasturage. The average estimated gross returns per acre for the season for all crops was \$16.93. The markets were local, there being no outlet for other than live stock from the project.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected water rentals	\$3,974.50		\$3,974.50
Inventories:			
Mercantile stores	40.09		
Government animals	8,004.05		
Equipment in use	13,276.35		
Storehouse	6,252.33		
Cement	3,104.35		
Lumber	390.11		
Explosives	778.53		
Forage	176.01		
Fuel	90.23		
Local products	642.97		
Cost of work:			
Building cost	1,336,045.69		
Plus adjustments	3,510.13		
Less accrued revenues		\$19,955.15	
	1,339,555.82	19,955.15	1,319,600.67
Operation and maintenance cost	18,767.01		18,767.01
Total			1,375,124.23
LIABILITIES.			
Accounts payable:			
Unpaid labor		2,556.06	
Unpaid purchases		1,405.84	
Unpaid contract estimates		23,416.13	
Unpaid contract holdbacks		2,683.07	
Unpaid freight and express		13,615.16	
Unpaid passenger fares		134.45	
Unpaid land agreements		31,345.30	
Unpaid miscellaneous		2,805.14	
Investment of the United States:			
Disbursement vouchers		1,296,478.16	
Collection vouchers	16,615.55		
Transfer vouchers received		26,951.97	
Transfer vouchers issued	9,661.50		
	26,267.05	1,323,430.13	1,297,163.08
Total			1,375,124.23

Total cost to June 30, 1908, distributed to principal physical features

Main canal and tunnel:

Earthwork	\$301,466.51
Concrete lining, tunnel timbering, and paving	111,002.99
Concrete structures, including steel gates	19,106.33
Highway bridges	7,056.33
Laterals and drains	39,230.10
Lateral bridges	2,206.45
Lateral structures (wooden drops, turnouts, etc.)	2,678.50
Fencing	699.68

East branch canal:	
Earthwork	\$34, 301.05
Concrete structures	692.74
Bridges and culverts	2, 138.85
South branch canal:	
Earthwork	27, 219.63
Wooden flume	10, 293.23
Bridges	75.26
Laterals	2, 113.09
Lateral structures	21.65
Keno canal:	
Earthwork, including headworks	65, 344.54
Concrete structures, including steel gates	8, 308.46
Poe Valley canals (location and survey)	1, 421.00
Poe Valley laterals (location and survey)	545.85
Clear Lake reservoir (preliminary expense)	736.18
West Side canal, upper project (location and survey)	277.21
East side canal, upper project (location and survey)	1, 010.81
Horse Fly reservoir (preliminary expense)	106.61
Lost River drainage canal (preliminary expense)	611.96
Drainage system (preliminary expense)	971.54
Experimental farm	169.15
Hydrography	8, 145.96
Rock crushing plant	4, 260.91
Real property and rights of way	537, 750.99
Buildings (office, barns, headgates house, etc.)	7, 577.74
Telephone system	4, 466.08
Irrigable lands	265.54
Examination of project as a whole	51, 879.52
Administration of project as a whole	81, 475.35
Cost ledger inventories	417.90
<hr/>	
Total building cost as per debit in cost of work in statement of assets and liabilities	1, 336, 045.69

COLORADO
GRAND VALLEY PROJECT

GENERAL STATEMENT

The principal data relating to the Grand Valley project are summarized as follows:

County: Mesa.

Townships: 1 N., Rs. 1 E. and 1 and 2 W., U. M.; 2 N., Rs. 2 and 3 W., U. M.; 1 S., Rs. 1 E. and 1 W., U. M.; 9 S., Rs. 103 and 104 W., sixth principal meridian; 10 S. Rs. 98, 101, and 103 W., sixth principal meridian; 11 S., Rs. 98 and 99 W., sixth principal meridian.

Irrigable area: 60,000 to 70,000 acres. Ownership, 30 per cent public, remainder private.

Average elevation of irrigable area: 4,700 feet above sea level.

Average annual rainfall on irrigable area: 6 to 11 inches.

Range of temperature on irrigable area: Maximum, 100°; minimum, -15°.

Character of soil of irrigable area: Red mesa sand, black bottom sandy loam, and adobe.

Duty of water: 1 second-foot at headgates per 80 acres.

Principal products: Sugar beets, grain, and fruit.

Railroad stations: Palisades, Clifton, Grand Junction, Fruita, Loma, and Mack, Colo.

Railroads: Denver and Rio Grande and Colorado Midland.

Principal markets: Missouri and Mississippi Valley cities.

Watershed area: 8,550 square miles.

Reservoir: None.

Storage dam: None.

Diversion dam: Not designed.

Main canals: Length, 60 miles.

Tunnels: Length, 9,000 feet.

Per cent of project completed: Preliminary work.

A detailed description of the Grand Valley project will be found in the second annual report and general descriptions relating to the project are given in the other annual reports. Briefly, the irrigation plan of this project contemplates the construction of a diversion dam on the Grand River at a point about 18 miles above Grand Junction, Colo., for diverting water into a canal covering lands on the north side of the Grand River in the vicinity of Palisades, Grand Junction, and Fruita.

In February, 1908, a permanent office was established on the project, and since that date the irrigable area, including all possible canal routes, has been mapped on a scale of 1,000 feet to the inch with contour intervals of 10 feet. The first 6 miles of the canal have been located, and plans and estimates prepared. Construction had not been authorized at the close of the fiscal year.

FINANCIAL STATUS AND FEATURE COSTS

Assets and Liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Inventories:			
Government animals.....	\$496. 50		\$2,497.14
Equipment in use.....	1,414. 62		
Storehouse.....	588. 02		
Cost of work:			
Building cost.....	16,681. 33		17,262. 49
Plus adjustments.....	571. 16		
Total.....			19,749. 63
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		\$1,180. 00	1,742. 00
Unpaid purchases.....		373. 33	
Unpaid freight and express.....		131. 51	
Unpaid passenger fares.....		57. 25	
Investment of the United States:			
Disbursement vouchers.....		15,681. 92	18,007. 73
Collection vouchers.....	. 19		
Transfer vouchers received.....		2,325. 81	
	. 19	18,007. 73	18,007. 73
Total.....			19,749. 63

Total cost to June 30, 1908, distributed to principal physical features

Preliminary examination and surveys..... \$16,681.33

UNCOMPAHGRE VALLEY PROJECT

GENERAL STATEMENT

The principal data relating to the Uncompahgre Valley project are summarized as follows:

Counties: Montrose and Delta.
 Townships: 15 S., Rs. 94 to 96 W., sixth principal meridian; 48 to 51 N., Rs. 7 to 12 W., N. M. M.
 Irrigable area: 146,000 acres.
 Average elevation of irrigable area: 5,000 to 6,400 feet above sea level.
 Average annual rainfall on irrigable area: 6 to 12 inches.
 Range of temperature on irrigable area: Maximum, 98°; minimum, —20°.
 Character of soil of irrigable area: Red sandy gravel, adobe, and clay loam.
 Duty of water: 1 second-foot at head gates per 80 acres.
 Size of farm units: 40 to 80 acres.
 Principal products: Alfalfa, hay, grain, sugar beets, fruits, and vegetables.
 Railroad stations: Montrose, Olathe, and Delta, Colo.
 Railroad: Denver and Rio Grande.
 Principal markets: Denver and local mining camps.
 Watershed area: 3,850 square miles.
 Average annual rainfall on watershed: 7 to 20 inches.
 Estimated annual run-off of watershed: 1,500,000 acre-feet.
 Reservoir: None.
 Storage dam: None.
 Diversion dam: Not yet designed.
 Main canals: Length, 108 miles.
 Tunnels: Length, Gunnison, 30,583 feet; south canal, 2,267 feet.
 Construction of project authorized: March 14, 1903.
 Per cent of project completed: 61.

A detailed description of the Uncompahgre Valley project will be found in the fifth annual report, and general descriptions relating to the project are given in the other annual reports. Briefly, the irrigation plan of this project involves the construction of a diversion dam across the Gunnison River, diverting water through the Gunnison tunnel into a canal, called "south canal," leading to the Uncompahgre Valley, there supplementing the flow of the Uncompahgre River for the irrigation of lands on that stream in the vicinity of Montrose, Olathe, and Delta, Colo. The water diverted will be used in conjunction with that of the Uncompahgre River for supplying existing canal systems and to supply a high-line canal on the right side of the Uncompahgre River, called "east canal," taking water therefrom by means of a diversion dam to be constructed a short distance below the entrance of the Gunnison River water. An additional diversion dam is to be constructed at a short distance above the entrance of the Gunnison River water for diverting water into a high-line canal on the left side of the river, called "west canal." The Gunnison tunnel is under construction and the south canal is completed. The east and west canals are yet to be constructed.

GUNNISON TUNNEL

Work on the Gunnison tunnel by force account has been pushed as vigorously as economical progress would permit. The encountering of underground water courses and reservoirs has proven to be the greatest impediment to progress and the cause of a large amount of extra expense. It has been found uneconomical to liberate water in the east portal heading in excess of the capacity of the pumps to handle it, consequently it has been necessary at times while waiting for the water to be pumped out to employ an efficient and expensive heading crew in the miscellaneous work that would ordinarily be done at less cost. On July 16, 1907, a flow of water sufficient to stop work was encountered in this heading. The discharge amounted to 3.5 second-feet initially and gradually diminished until on August 25 it again became possible to resume work. On February 6, 1908, seamy ground was encountered from which water issued at widely scattered points. This ground continued for 84 feet, and timbering was necessary to make the work safe. Occasional delays to the work of the drillmen were caused by the water gaining on the pumps and rising in the heading. The flow of water persisted through March and April, and on April 22 so much water was encountered in the drill holes that it was not considered safe to continue work. The pumps have meanwhile been kept in continuous operation, removing water at the rate of over nineteen million gallons per month. This flow has continued to June 30, with no signs of abatement. A new pump has been ordered and a discharge pipe-line 12 inches in diameter is being installed. When the installation has been completed attempts to advance this heading will be made.

It is worthy of note that in January, 1908, the heading force at river portal excavated 449 linear feet, thus establishing the American tunnel record for the greatest advance of one working force in hard rock in one month. The material encountered in this heading has consisted either of schist or granitic gneiss throughout the year.

The west portal heading was advanced through alternating seams of shale and conglomerates in July and August of 1907. In August the ground ceased to require timbering. Since September 16 the advance has been through granitic formation. In August, Cedar Creek broke into the tunnel through the rescue shaft sunk on May 30, 1905. The heading force spent six days in restoring normal working conditions. Beginning in December the excavation was made through fissured water-bearing rock, in which the water pressure frequently forced the powder out of the holes before the charge could be fired. On February 25 an underground water course was struck that raised the total volume discharged from the west portal to $7\frac{1}{2}$ second-feet. This volume of water delayed drilling, increased the labor of mucking, increased the cost of track work, and necessitated raising upon timbers some $3\frac{1}{4}$ miles of tram track. Since the end of April the quantity of water at the breast of the heading has been small, but the total discharge from the portal has remained practically constant at $7\frac{1}{2}$ second-feet.

The progress of work on the Gunnison tunnel made during the past year is indicated by the following tabulation:

Progress of excavation, Gunnison tunnel

	Total, June 30, 1907.		Progress during year ending June 30, 1908.		Total, June 30, 1908.	
	East ehd.	West end.	East end.	West end.	East end.	West end.
Tunnel excavation, full section 11 by 12 feet.....	<i>Lin. ft.</i> 6,749	<i>Lin. ft.</i> 13,030	<i>Lin. ft.</i> 247	<i>Lin. ft.</i> 516	<i>Lin. ft.</i> 6,996	<i>Lin. ft.</i> 13,546
Tunnel excavation, undercut drift 11 by 8½ feet.....	145	66	2,245	2,691	2,390	2,757
Concrete lining, floor.....		12,200		1,252		13,452
Concrete lining, side walls and arch.....		4,104		4,250		8,414
Timbering.....	245	12,882	38	483	373	13,365

SOUTH CANAL

All contract work on the south canal has been completed, the contract for construction of divisions 10 to 21 having been finished in October, 1907, and that for construction of division 22 and extra work on a protective crib in the Uncompahgre River in May, 1908. Timber for the south canal outlet works is seasoning preparatory to preservative treatment. The uncompleted work on the south canal now consists of the outlet works, the dam on division 18, and the drop and wasteway at the end of the portal cut of the Gunnison tunnel, all of which will be completed by force account.

Since March the water from the tunnel has been used to test and season this canal. With the exception of a few failures of concrete, due to pressure from swelling ground, the canal has been found satisfactory.

EAST AND WEST CANALS

Construction work on the east and west canals is being held in abeyance pending the outcome of negotiations for the acquisition of a number of private canals by the water users' association. The design of the distribution system will not be finished until after these negotiations are closed.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Uncompahgre Valley project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
66	Orman & Crook.....	South canal, divisions 10 to 21.	\$513,365.00	a \$467,518.61	Sept. 30, 1906
92	McPhee & McGinnity.....	Cement.....	42,900.00	a 43,285.52	.....
164	Portland Cement Co.....	do.....	37,675.13	a 37,080.90	June 20, 1908
172	Western States Portland Cement Co.....	do.....	4,707.16	a 4,707.16	Sept. 1, 1907
182	Smith Brothers.....	South canal, division 22..	18,254.50	a 21,703.98	Apr. 30, 1908

a Completed.

SETTLEMENT

The great possibilities in the soil have furnished real estate agents the basis for conducting an active campaign since the inception of the project. Immigration has been induced more rapidly than conditions warranted. At present the available water is far from sufficient to supply properly the residents of patented lands under privately built ditches. It is hoped that water from the Gunnison River can be delivered to remedy this situation in 1909, but it will not be possible to relieve the settlers upon arid homesteads above the existing canals until new high-line canals can be completed in 1910 or later.

OPERATION

On June 1, 1908, the Reclamation Service took over the operation of the Montrose and Delta canal system. It is continuing the operation along the same lines as its predecessors, with practically the same local organization in direct charge. This year water is being supplied for the irrigation of about 15,000 acres. A reasonable expenditure for increasing the carrying capacity will enable this canal to serve a much larger acreage when water is delivered through the Gunnison tunnel.

RESULTS OF IRRIGATION

Of the land under the project 80,000 acres is best adapted to alfalfa, grains, and vegetables, and 60,000 acres to fruit. All of the fruit lands under ditch are patented. These lands when developed to commercial apple and peach orchards, bearing and properly cared for, will give splendid returns and the less desirable adobe lands yield abundantly when properly irrigated.

The following figures represent what are considered average yields of the staple crops on suitable soil with proper care:

Average yield of crops in Uncompahgre Valley

Apples (10-year-old trees).....	500 boxes per acre.
Peaches (8-year-old trees).....	800 boxes per acre.
Potatoes.....	165 to 800 bushels per acre.
Alfalfa.....	4½ to 7 tons per acre.
Wheat.....	49 to 63 bushels per acre.
Oats.....	60 to 80 bushels per acre.
Sugar beets.....	15 to 25 tons per acre.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected miscellaneous.....	\$763.50		\$763.50
Inventories:			
Mercantile stores.....	16,807.28		102,675.22
Government animals.....	1,933.50		
Equipment in use.....	15,331.56		
Storehouse.....	19,143.13		
Cement.....	26,266.02		
Iron and steel.....	2,261.19		
Lumber.....	3,240.76		
Explosives.....	8,668.69		
Forage.....	1,749.84		
Fuel.....	4,243.25		
Cost of work:			
Building cost.....	3,104,078.15		3,079,798.83
Less adjustments.....		\$14,826.90	
Less accrued revenues.....		9,452.42	
	3,104,078.15	24,279.32	
Operation and maintenance cost.....	548.52		Cr. 13,229.81
Less accrued revenues.....		13,778.33	
	548.52	13,778.33	
Total.....			3,170,007.74
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		12,133.89	39,403.25
Unpaid purchases.....		7,955.12	
Unpaid contract holdbacks.....		1,750.00	
Unpaid freight and express.....		17,191.39	
Unpaid passenger fares.....		164.60	
Unredeemed coupon books.....		208.25	
Investment of the United States:			
Disbursement vouchers.....		3,143,494.71	3,130,604.49
Collection vouchers.....	71,111.06		
Transfer vouchers received.....		60,913.11	
Transfer vouchers issued.....	2,692.27		
	73,803.33	3,204,407.82	
Total.....			3,170,007.74

Total cost to June 30, 1908, distributed to principal physical features

Montrose and Delta canal system (purchase price).....	\$111,000.00
Taylor Park dam.....	466.81
Cimarron lateral.....	1,209.38
Gunnison tunnel:	
West portal—	
Power plant.....	79,266.97
Driving.....	942,913.53
Ventilating shafts Nos. 1 and 2.....	20,267.24

Gunnison tunnel—Continued.

West portal—Continued.	
Lining -----	\$140,732.78
Engineering and superintendence -----	30,287.72
East portal—	
Power plant -----	34,821.35
Driving -----	586,625.84
Engineering and superintendence -----	13,599.01
South canal, earthwork and structures -----	700,028.85
West canal, final location survey -----	14,060.10
East canal, final location survey -----	8,809.57
Wagon road:	
Construction -----	24,726.09
Maintenance -----	6,956.05
Buildings (offices, dormitories, warehouses, etc.) -----	117,653.48
Telephone system -----	5,961.94
Irrigable lands (farm units, subdivisions, and soil examination) --	6,415.88
Topographic surveys -----	64,445.27
Examination of project as a whole -----	7,731.08
Administration of project as a whole -----	186,099.21

Total building cost as per debit in cost of work in statement of assets and liabilities -----	3,104,078.15
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IDAHO

DUBOIS PROJECT

A detailed description of the Dubois project will be found in the fourth and fifth annual reports. A part of the irrigable lands withdrawn in connection with this project were restored to entry during the fiscal year. The expenditures on the project for the fiscal year have been for services, freight, advertising, and stream gaging, amounting to \$721.49, making a total expenditure to June 30, 1908, of \$16,567.93.

MINIDOKA PROJECT

GENERAL STATEMENT

The principal data relating to the Minidoka project are summarized as follows:

Counties: Lincoln and Cassia.

Townships: 7 to 12 S., Rs. 20 to 28 E., B. M.

Irrigable area: Gravity system, 84,200 acres (ownership, public, 77,320 acres; State, 6,880 acres; private, 200 acres); pumping system, 49,900 acres.

Average elevation of irrigable area: 4,200 feet above sea level.

Average annual rainfall on irrigable area: 15 to 19 inches.

Range of temperature on irrigable area: Maximum, 96°; minimum, 12°.

Character of soil of irrigable area: Clay, sandy loam, and loose sandy soil.

Duty of water: 3 acre-feet per acre per annum.

Size of farm units: 40 to 80 acres.

Principal products: Alfalfa, cereals, sugar beets, and vegetables.

Railroad stations: Minidoka, Acequia, Rupert, Heyburn, and Burley, Idaho.

Railroad: Minidoka and Southwestern.

Principal markets: Local towns and Butte, Mont.

Watershed area: 17,900 square miles.

Estimated annual run-off of watershed: 7,200,000 acre-feet.

Reservoir: Jackson Lake, area, 30,000 acres; capacity, 900,000 acre-feet.

Storage dam: Type, earth and rockfill; height, 50 feet; length, 4,300 feet.

Diversion dam: Type, earth and rockfill; height, 52 feet; length, 600 feet.

Main canals: Length, gravity system 130 miles; pumping system 70 miles.

Laterals: Length, gravity system 190 miles; pumping system 60 miles.

Power development: 12,000 to 30,000 horsepower.

Power transmission lines: Length, 13 to 20 miles.

Pumping stations: Number, three; capacity, 300 to 500 second-feet each.

Construction of project authorized: March 21, 1904.

Per cent of project completed: Gravity system, 100; pumping system, 30.

A detailed description of the Minidoka project will be found in the fifth annual report and general descriptions relating to the project are given in all of the other annual reports. Briefly, the irrigation plan of this project involves the construction of a storage reservoir at Jackson Lake, Wyoming, on the headwaters of the Snake River; a diversion, power, and storage dam on Snake River at a point about 6 miles south of Minidoka, Idaho; and two canal systems, one on each side of the river, heading at the diversion dam and covering lands in

the vicinity of Acequia, Rupert, and Heyburn, Idaho. Power will be developed at the diversion dam for generating electrical energy for pumping water onto lands from the canal on the south side of Snake River. A temporary dam impounding 300,000 acre-feet of water has been erected at Jackson Lake; the diversion and power dam and the diversion canals for the gravity system are finished, and the power and pumping plants and the canals for the pumping system are under construction.

JACKSON LAKE DAM

The temporary dam at the outlet of Jackson Lake was completed in October, 1907. This dam will raise the water surface of Jackson Lake 15 feet above the present low-water surface, and will store about 300,000 acre-feet. Under date of December 4, 1907, a contract was entered into between the United States and the Twin Falls North Side Land and Water Company wherein it was provided that the United States should deliver 140,000 acre-feet of stored water per annum for use on this company's project. A contract dated January 28, 1908, was also entered into with the American Falls Canal and Power Company for the delivery of 70,000 acre-feet of stored water per annum to that company. The outlet gates of the Jackson Lake dam were closed on July 1, 1908, and about 150,000 acre-feet of water were stored. No attempt was made to store the maximum amount, for the reason that it would not be needed during the season of 1908. In August, 1908, these gates will be opened and an attempt made to deliver water for use on the Minidoka project and as provided in the above contracts.

SOUTH SIDE PUMPING SYSTEM

In December, 1907, survey parties were placed in the field for the purpose of locating for use in a proposed pumping system three canals on the south side of Snake River, in Cassia County, and these surveys and the construction of the canals were pushed rapidly in order to comply with the laws of Idaho concerning the construction of canals within the period of five years from the date of filing appropriation of water. This period, for the Minidoka project appropriation from Snake River, expired June 23, 1908. The surveys were completed in June, 1908. The lift for each of the three canals of the pumping system is 30 feet, the water for the first being pumped from the south side gravity canal, that for the second being pumped from the first high-line canal, and that for the third being pumped from the second high-line canal. Each canal will cross Marsh Creek in a double-barreled inverted siphon constructed of reenforced concrete, each barrel having a diameter of 5 feet. At the Goose Creek crossing of each canal will be provided means for diverting the flow of the creek into the canal and a spillway for discharging the surplus.

The total area covered by the three canals is about 49,900 acres. The construction of these canals was undertaken by the South Side Minidoka Water Users' Association in accordance with a contract signed by the Association March 30, 1908, the work being let in small amounts to settlers and being paid for with certificates receivable for water-right charges on the project. Excavation was begun April 1, 1908, and practically completed June 23, 1908, the total excavation being 840,000 cubic yards. A temporary pumping plant consisting

of a gas engine and centrifugal pump capable of throwing 20 second-feet was installed at the head of the first high-line canal and was put in operation June 22, 1908.

The sublateral system and structures will be constructed during the fall of 1908 and the spring of 1909. The power house and permanent pumping stations will also be completed and machinery installed, it is hoped, in time to deliver water during the season of 1909.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Minidoka project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completions due—
18	Portland Cement Co. of Utah.	Cement	\$41,300.00	• \$59,852.25	.....
53	Orman and Crook	Distributing system, schedules 1, 5, 6, and 7.	354,823.02	• 441,897.37	Nov. 30, 1906
101	Illinois Steel Co.	Cement	4,972.00	4,972.00	.....
217	Weber Gas Engine Co.	Gas engines	8,100.00	6,075.00	Feb. 2, 1908
237	Portland Cement Co.	Cement	617.40	617.40	Oct. 1, 1906
239					

• Completed.

LANDS OPENED FOR IRRIGATION

On March 8, 1907, approved plats of nine townships, designating about 82,159 acres of land* irrigable under this project, were forwarded to the General Land Office with the following public notice. The greater part of these lands had already been entered under the homestead law as required in the reclamation act.

PUBLIC NOTICE DATED MARCH 9, 1907

In pursuance of the provisions of sec. 4 of the reclamation act of June 17, 1902 (32 Stat. L., 388), notice is hereby given that water will be furnished from the Minidoka project in Idaho, under the provisions of the reclamation act, at the opening of the irrigation season of 1907, for the irrigable lands shown upon farm unit plats of: Tps. 9 and 10 S., R. 22 E., Boise meridian; Tps. 9 and 10 S., R. 23 E., Boise meridian; Tps. 8, 9, and 10 S., R. 24 E., Boise meridian; Tps. 8 and 9 S., R. 25 E., Boise meridian; approved by the Secretary of the Interior and on file in the local land office at Hailey, Idaho.

The limit of area per entry representing the acreage which, in the opinion of the Secretary of the Interior, may be reasonably required for the support of a family on the lands in question is fixed for the lands entered, subject to the provisions of the reclamation act in general, at 40 acres within $1\frac{1}{2}$ miles of the towns, and 80 acres elsewhere, subject to the variations required by the physical conditions, the amounts being shown upon the plats for the several farm units.

The limit for which water right application may be made for lands in private ownership shall be 160 acres of irrigable land for each landowner.

The charges which shall be made per acre upon the said entries and upon lands in private ownership which can be irrigated by the waters of the said irrigation project are in two parts, as follows:

(1) The building of the irrigation system, \$22 per acre, payable in not less than five nor more than ten annual installments—each not less than \$2.20 per acre.

(2) For operation and maintenance, which will, as soon as the data are available, be fixed in proportion to the amount of water used, with a minimum charge per acre whether water is used thereon or not. The operation and maintenance charges for the irrigation season of 1907 will be 40 cents per acre of irrigable land.

The first installment of said charges for all irrigable areas shown on these plats, whether or not water right application is made therefor, or water is used thereon, shall be due and payable on or before December 1, 1907, at the local land office at Hailey, Idaho—the total amount for 1907 being not less than \$2.60 per acre. The building charge for subsequent years shall be due and payable at the same place on or before December 1, and the operation and maintenance charge shall become due and be of the amount as announced by the Secretary of the Interior each year.

INSTRUCTIONS ACCOMPANYING PUBLIC NOTICE

This notice was accompanied by request that the local land officers be instructed to announce that water-right applications must be filed in proper form in the local land office before water will be furnished; that the amount of water to be furnished to be stated in the second paragraph of the water-right application is 3 acre-feet per acre per annum; that the building charge and number of installments are to be stated in the third paragraph of each application, and that the secretary has not entered into a contract with a water users' association on the project, and therefore the certificate of the water users' association forming part thereof can not be filled out.

ORDER DATED JULY 9, 1907

In pursuance of the public notice issued under the provisions of the reclamation act for the Minidoka project, Idaho, under date of March 8, 1907, it is hereby ordered—

1. That such part of the charge for the project as has been fixed for operation and maintenance—namely, 40 cents per acre—may be paid independently of the building charge.

2. In pursuance of the authority contained in section 10 of the reclamation act for the establishment of rules and regulations necessary and proper for the purpose of carrying the provisions of the act into full force and effect, the following rule is promulgated for said project—that all charges due for operation and maintenance must be paid for all the irrigable land included in any water-right application on or before April 1 of each year, in default of which no water will be furnished for the irrigation of such lands.

ORDER DATED JULY 9, 1908

The clause designated (1) of the public notice issued under the provisions of the reclamation act for the Minidoka project, Idaho, under date of March 9, 1907, is hereby amended to read as follows:

(1) The building of the irrigation system, \$22 per acre, payable in not more than ten annual installments, each not less than \$2.20 per acre; provided, however, that full payment may be made at any time of any balance remaining due, after certification has been made by the Commissioner of the General Land Office that full and satisfactory compliance has been shown with all the requirements of the law as to residence, cultivation, and reclamation.

SETTLEMENT

Of the 82,158.68 acres of land opened by the public notice of March 9, 1907, 79,987.31 acres are in public ownership and are divided into 1,202 farm units; 985 of these units have been entered, covering 67,145.06. The remaining 2,171.37 acres are in private ownership, and water-right applications have not yet been made therefor.

OPERATION AND MAINTENANCE

For the irrigation season of 1908 water was flowing in the canals and available for use April 1, 1908. The following summary shows the status of the use of water on the project on June 30, 1908.

Status of use of water, Minidoka project

Number of farm units containing cultivated land.....	1,050
Number of farm units receiving water on June 30.....	980
Area in cultivation, 1908, acres.....	32,000
Area actually irrigated, estimated, acres.....	40,000

Owing to the unusual contour of the land of this project it was expected that many serious difficulties would have to be overcome during the first season's use of the canal system. Nearly the entire water section for more than 100 of the 130 miles of the main canals and branches is above the natural surface of the ground, delivery of water being made from both sides of all of the canals on the north side of the river throughout their entire length. On account of the high elevation of some of the lands adjacent to these canals, it became necessary to deliver water at the maximum level for which the ditches were designed. It was not possible to do this with the permanent checks provided at each main turn-out, owing to the comparatively small volume of water used this season, and even with the installation of temporary checks, the water surface at many points had to be raised nearly a foot above the maximum level provided for by the plans.

Seepage appeared at many points along the canal banks, but owing to the extra thickness of the banks and constant watching, no breaks occurred. The seepage was due to a fine black quicksand having been used in construction. The imperviousness of the canal banks was improved by excavating a blanket of quicksand from the inside slope and replacing it with a layer of clay. The imperviousness of the canal bottom was improved where the quicksand was shallow by excavating a trench on each side of the bottom, and where the quicksand was deep by excavating a blanket thereof from the bottom and filling the excavations with clay. In some portions of the canal seepage in the bottom was stopped by throwing clay into the water.

During the season of 1908 there has been no trouble from seepage, but a great deal from wave action. As there was little trouble from wave action last season, it was expected that with settled banks there would be none this season, but, owing to continued high winds, extensive portions of the banks, even those having 3 to 1 slopes, were cut back until special protection was necessary. In most cases this protection was made of sagebrush by setting the butts into the bank and exposing the brushy ends to the impact of the waves. This method of protection has been found cheaper and in most cases less liable to undermining than rock riprapping. Grass seed was sown on all banks last fall and again this spring, but with poor results, partially owing to the dry, windy weather. Noxious weeds, such as foxtail, sweet clover, and dock, were pulled from all canal banks and right of way and burned.

The operative force has consisted of a water master, nine ditch riders, a gate tender, and a telephone clerk. During the season of 1909 the operative force will be increased, as 50,000 acres will be added to the irrigable area by the pumping system.

The season has been very discouraging to settlers in the sandy strip along the river. Dry, windy weather has necessitated much replanting of crops. On other portions of the project good crops have been raised where the land was well leveled and the farm laterals constructed properly. Ignorance or neglect of these two requisites is the cause of most of the failures. There is urgent need of a demonstration farm to give the farmers practical lessons as to what kinds of crops to raise and how to raise them. All farm units on the project have been entered, but there are a few opportunities for new settlers to acquire farms from settlers willing to relinquish a part or all of their claims.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected water right building charges.....	\$132,397. 06		
Uncollected water right operation and maintenance charges.....	22,744. 70		
Less unadjusted water users' association work.....		\$55,487. 28	
	155,141. 75	55,487. 28	\$99,654. 47
Inventories:			
Equipment in use.....	7,501. 89		
Less depreciation.....		701. 44	
Storehouse.....	5,926. 13		
Cement.....	647. 41		
Iron and steel.....	112. 73		
Lumber.....	940. 63		
Forage.....	907. 45		
Fuel.....	286. 61		
	16,322. 85	701. 44	15,621. 41
Cost of work:			
Building cost.....	1,934,182. 53		
Less adjustments.....		780. 14	
Less accrued revenues.....		228. 12	
Less accrued repayments.....		135,546. 48	
	1,934,182. 53	136,554. 74	1,797,627. 79
Operation and maintenance cost.....	39,911. 00		
Less accrued repayments.....		24,644. 82	
	39,911. 00	24,644. 82	15,266. 18
Total.....			1,928,169. 85
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		4,923. 96	
Unpaid purchases.....		8,213. 96	
Unpaid contract estimates.....		30,449. 09	
Unpaid contract holdbacks.....		2,025. 00	
Unpaid freight and express.....		6,663. 05	
Unpaid passenger fares.....		135. 42	
Unredeemed meal tickets.....		231. 25	
Unpaid miscellaneous.....		1,481. 88	
			54,123. 61
Investment of the United States:			
Disbursement vouchers.....		1,853,700. 52	
Collection vouchers.....	10,823. 91		
Transfer vouchers received.....		47,628. 94	
Transfer vouchers issued.....	16,459. 31		
	27,283. 22	1,901,329. 46	1,874,046. 24
Total.....			1,928,169. 85

Total cost to June 30, 1908, distributed to principal physical features

Temporary storage dam at Jackson Lake.....	\$25,342.59
Minidoka dam and spillway (diversion, power, and storage dam).....	504,209.35
Gravity system:	
Main canals (north and south side):	
Earthwork.....	383,929.31
Canal structures and bridges.....	86,278.52
Waste channel.....	18,555.43
Distributing system:	
Earthwork "A," "B," and "C" lines and laterals.....	353,047.85
Canal structures and bridges.....	170,249.81
Pumping system:	
Power plant.....	24,319.90
South side:	
Pumping stations.....	2,704.75
Canals, feeders, etc.....	37,216.15
Earthwork.....	33,226.01
Structures.....	2,470.22
Real estate (rights and property).....	35,234.14
Buildings (offices, dormitories, warehouses, etc.).....	21,895.06
Telephone system.....	13,135.15
Irrigable lands (farm units, subdivisions, and soil examination).....	3,834.29
Examination of project as a whole.....	82,744.95
Administration of project as a whole.....	79,090.14
Engineering.....	56,698.91

Total building cost as per debit in cost of work in statement of assets and liabilities.....	1,934,182.53
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PAYETTE-BOISE PROJECT**GENERAL STATEMENT**

The principal data relating to the Payette-Boise project are summarized as follows:

- Counties: Ada, Canyon, and Owyhee.
- Townships: 1 to 10 N., Rs. 1 to 5 W., and 1 to 2 E., B. M.
- Irrigable area: 372,000 acres. Ownership, public, 254,000 acres; private, 118,000 acres.
- Average elevation of irrigable area: 2,500 feet above sea level.
- Average annual rainfall on irrigable area: 12.7 inches.
- Range of temperature on irrigable area: Maximum, 107°; minimum, — 28°.
- Character of soil of irrigable area; Light, sandy loam.
- Duty of water: 4 acre-feet per acre per annum measured at canal headgates.
- Size of farm units: 80 acres.
- Principal products: Alfalfa, sugar beets, apples, prunes, and small fruits.
- Railroad stations: Boise, Payette, Nampa, Meridian, and Caldwell, Idaho.
- Railroads: Oregon Short Line; Boise, Nampa and Owyhee; and Idaho Northern.
- Principal markets: Payette, Nampa, Boise, Meridian, and Caldwell, Idaho; Portland, Oreg., and eastern cities.
- Watershed area: 6,000 square miles.
- Average annual rainfall on watershed: 25 inches.
- Estimated annual run-off of watershed: 3,600,000 acre-feet.
- Reservoirs: Dear Flat, area, 9,250 acres; capacity, 186,000 acre-feet. 8 other reservoirs, combined capacity, 181,500 acre-feet.
- Storage dams: Upper Deer Flat, type, earth embankment; height, 70 feet; length, 4,000 feet. Lower Deer Flat, type, earth embankment; height, 40 feet; length, 7,200 feet. Others not designed.
- Diversion dams: Upper Boise River, type, cyclopean masonry weir; height, 45 feet; length, 400 feet. Others not designed.
- Main canals: Length, 400 miles.

Laterals: Length, 1,000 miles.

Power development: 12,500 horsepower.

Power transmission lines: Length, 29 miles.

Construction of project authorized: March 27, 1905.

Per cent of project completed: 98.7.

A detailed description of the Payette-Boise project will be found in the fifth annual report, and general descriptions relating to the project are given in the second, third, fourth, and sixth annual reports. Briefly, the irrigation plan of this project involves the construction of storage reservoirs on the headwaters of the Payette and Boise rivers, a diversion dam on the Payette River, and two diversion dams on the Boise River, diverting water onto lands in the Payette, Boise, and Snake River valleys. The diversion dam on the Payette River will be built about 6 miles above Emmett, Idaho, diverting water into a canal on the south side of the Payette River, covering land in the Payette and Boise River valleys. A diversion dam is being built on the Boise River at a point about 8 miles above Boise, Idaho, diverting water into an inlet and distributing canal supplying the Deer Flat reservoir in the vicinity of Nampa and covering lands lying between the Boise and Snake rivers. The construction of a second diversion dam is contemplated on the Boise River near Caldwell, diverting water into a canal on the north side of the river, covering lands in the Payette and Boise River valleys. A fourth division of the project contemplates the construction of storage reservoirs on Succor Creek, on the south side of the Snake River, which, in conjunction with a pumping plant installed on the Snake River and operated by electrical power generated at the diversion dam on the Payette River will irrigate lands on the south side of the Snake River in the vicinity of Succor Creek. Work has thus far been concentrated on the construction of the system covering the lands between the Boise and Snake rivers. The diversion dam above Boise, the diversion canal, and Deer Flat reservoir are practically completed.

BOISE RIVER DAM

The progress of the work of constructing the Boise River dam has been slow. In February, 1908, a sudden rise of the Boise River flooded the contractor's plant and delayed operations for several weeks. Again in March the contractor was compelled to discontinue work on account of the condition of the river. Very little was accomplished until after the permanent subsidence of the spring flood. On June 30, 1908, 91 per cent of the work had been completed, and it is expected to have the dam entirely completed by September 30, 1908.

MAIN CANAL EXCAVATION, FIRST DIVISION

The excavation of the first division of the main canal was somewhat delayed by an excess of hard material over the original estimates, but the work was completed and was accepted by the United States on April 20, 1908.

MAIN CANAL EXCAVATION, SECOND AND THIRD DIVISIONS

The contractors for the excavation of the main canal, divisions 2 and 3, have made slow progress. Work was practically suspended on April 15, 1908, in order that water might be turned into the canal for the use of irrigators under the New York canal, as provided by state law. On June 30, 1908, 98 per cent of the contract was completed. Work will be resumed at the end of the irrigation season and completed at an early date.

MAIN CANAL STRUCTURES

The structures on the main canal were completed May 1, 1908.

UPPER DEER FLAT EMBANKMENT

The upper Deer Flat embankment is being constructed by the United States by force account. Good progress has been made during the past year and on June 30, 1908, the work was 98 per cent completed. Owing to the failure of the Utah Fireproofing Company to complete the Boise River dam, it is impossible to divert water into the Deer Flat reservoir for use during the season of 1908. The delay in the completion of the upper embankment therefore did not cause any inconvenience.

LOWER DEER FLAT EMBANKMENT

The construction of the lower Deer Flat embankment was completed on January 17, 1908.

DISTRIBUTION SYSTEM

A few structures were built by the United States by force account during the year. All turn-outs along the main canal were completed by June 30, 1908, as were also the concrete arch structure under the Oregon Short Line Railroad and the crossing of the Boise, Nampa and Owyhee Railroad.

The distribution system is being constructed by cooperation with the Payette-Boise Water Users' Association. The Reclamation Service makes surveys and prepares profiles and the water users' association lets the contracts to settlers and others desiring to build the canals. Construction is supervised by engineers of the service. Payment is made in certificates receivable by the Reclamation Service in payment of water-right charges. Work was begun in March, 1908. Prior to June 30, 1908, 67 contracts were entered into, involving the excavation of about 862,730 cubic yards of material. Two hundred and thirty thousand one hundred and thirty-six cubic yards had been moved on that date and certificates to the value of \$18,647.83 had been issued. Work will be rushed on this distribution system so that water may be delivered to the lands under the Deer Flat reservoir during the season of 1909.

RIGHTS OF WAY

Very little progress has been made during the past year in negotiations for rights of way for the Deer Flat reservoir. All contracts for purchase of lands made to date have been closed and payment thereof made.

Status of Deer Flat reservoir right of way negotiations

Status of land.	Total in reservoir.	Purchased to date.	Balance to purchase.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Patented.....	6,955.37	3,307.59	3,647.78
Homestead.....	1,012.5	279	733.5
Homestead, final proof offered prior to June 30, 1908.....	879	320	559
State land.....	240	.....	240
State equities.....	418	.....	418
Total.....	9,504.87	3,906.59	5,598.28

Condemnation proceedings have been commenced to acquire the remainder of the patented land within the reservoir. Steps are also being taken to settle with homestead entrymen and with parties interested in state lands. It is expected that these negotiations will be concluded so that there will be no opposition to filling the reservoir in the spring of 1909.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Payette-Boise project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
89	Page & Brinton.....	Main canal, structures....	\$48,855.00	\$25,225.54	June 30, 1908
95	Hubbard & Carlson.....	Lower Deer Flat embankment.	256,550.00	* 269,931.04	Jan. 29, 1908
97	Conway & Wilhite.....	Main canal, Indian Creek to Deer Flat reservoir.	95,400.00	* 224,628.85	Feb. 28, 1908
101	Illinois Steel Co.....	Cement.....	17,428.00	17,712.00	.....
103	Page & Brinton.....	Main canal, schedules 2 and 3, excavation.	135,900.00	244,111.13	June 30, 1908
104	Utah Fireproofing Co.....	Boise River dam and headworks.	158,950.00	133,427.83	Jan. 1, 1908
105	Wm. H. Thompson.....	Main canal, schedule 1, excavation.	93,325.00	* 169,782.25	Apr. 30, 1908
212	Kansas Portland Cement Co.	Cement.....	5,000.00	5,460.70	Apr. 1, 1908
221	Western Building Material Co.	.....do.....	8,250.00	1,100.00	Oct. 1, 1908

* Completed.

SETTLEMENT

The public land under this project has been filed on rapidly since its withdrawal on March 5, 1903, for reclamation purposes. At the present time practically every tract that can be irrigated under the project has been entered, even though it is well known that in some

parts of the project it will be several years before water can be delivered. Under the first division, the works for which are practically completed and on which water will be delivered in the spring of 1909, there are some opportunities for new settlers to secure farms from settlers willing to relinquish a part or all of their claims.

OPERATION OF THE NEW YORK CANAL

As provided in a contract dated March 3, 1906, between the United States and the New York Canal Company, the Reclamation Service has continued the delivery of water to the stockholders in the New York canal. Owing to the failure of the contractors to complete the Boise River dam, it was necessary to continue the use of the old section of the canal between the old New York headworks and the dam, and therefore no advantage could be taken of the enlarged section of the canal. Considerable expense was incurred by the United States in putting the old headworks and upper section of the canal into condition to carry water. On April 15, 1908, water was turned into the canal and on April 22 it was being delivered throughout the length of the canal. No water was furnished to new lands under this project during the season of 1908.

FINANCIAL STATUS AND FEATURE COSTS

Assets and Liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected water rentals	\$2,666.90		\$12,046.44
Uncollected miscellaneous	9,379.54		
Inventories:			
Equipment in use	94,462.43		118,006.27
Storehouse	23,606.84		
Cost of work:			
Building cost	1,864,621.63		1,816,725.03
Less adjustments		\$1,517.06	
Less accrued revenues		46,379.54	
	1,864,621.63	47,896.60	
Operation and maintenance cost	14,135.51		11,468.61
Less accrued revenues		2,666.90	
	14,135.51	2,666.90	
Total			1,958,309.35
LIABILITIES.			
Accounts payable:			
Unpaid labor		9,085.42	93,939.45
Unpaid purchases		14,416.70	
Unpaid contract holdbacks		45,491.53	
Unpaid freight and express		24,881.75	
Unpaid passenger fares		64.05	
Investment of the United States:			
Disbursement vouchers		1,831,048.36	1,864,368.96
Collection vouchers	4,756.00		
Transfer vouchers received		40,519.95	
Transfer vouchers issued	2,442.41		
	7,198.41	1,871,568.31	
Total			1,958,309.35

Total cost to June 30, 1908, distributed to principal physical features

Boise diversion dam-----	\$247,064.27
Main canal:	
Earthwork-----	706,518.73
Structures-----	96,188.96
Deer Flat reservoir:	
Upper Deer Flat embankment--	
Earthwork-----	209,939.88
Structures-----	22,080.93
Equalizing trenches-----	3,549.92
Lower Deer Flat embankment-----	284,316.42
Deer Flat Nampa canal-----	1,495.99
Deer Flat Caldwell canal-----	244.53
Deer Flat north canal-----	.60
Deer Flat high line canal-----	15.66
Distributing system:	
Earthwork--	
Eight-mile lateral-----	387.27
Cole lateral-----	1,469.31
Farr lateral-----	3,053.62
Rawson lateral-----	8.12
Mason Creek feeder-----	223.17
Kuna lateral-----	6,670.55
Kuna high line lateral-----	30.40
North Nampa high line lateral-----	36.09
Ridenbaugh high line lateral-----	10,821.66
Bray lateral-----	3.60
Herron lateral-----	79.67
Structures (distributing system as a whole)-----	9,338.21
Real estate (rights and property)-----	121,740.56
Irrigable lands:	
Farm unit subdivision-----	3,136.87
Investigation-----	527.19
Preliminary surveys-----	18,625.43
Examination of project as a whole-----	39,525.68
Administration of project as a whole-----	76,210.08
Cost ledger inventories-----	1,318.28

Total building cost as per debit in cost of work in state-
ment of assets and liabilities----- 1,864,621.63

KANSAS

GARDEN CITY PROJECT

GENERAL STATEMENT

The principal data relating to the Garden City project are summarized as follows:

County: Finney.

Townships: 22 to 24 S., Rs. 32 to 35 W., sixth principal meridian.

Irrigable area: 10,656 acres. Ownership, private.

Average elevation of irrigable area: 2,925 feet above sea level.

Average annual rainfall on irrigable area: 20 inches.

Range of temperature on irrigable area: Maximum, 105°; minimum, -20°.

Character of soil of irrigable area: Fertile black sandy loam.

Duty of water: 2 acre-feet per acre per annum.

Principal products: Alfalfa, sugar beets, melons, sweet potatoes, and small fruits.

Railroad station: Garden City, Kans.

Railroad: Atchison, Topeka and Santa Fe.

Principal markets: Garden City, Kans.; Kansas City, Mo.; and Chicago, Ill.

Source of water supply: Pumping from wells.

Main canals: Length, 20 miles.

Laterals: Length, 12 miles.

Construction of project authorized: October 5, 1905.

Per cent of project completed: 85.8.

A detailed description of the Garden City project will be found in the fourth annual report, and general descriptions relating to the project are given in the third, fifth, and sixth annual reports. Briefly, the irrigation plan of this project involves the construction of a pumping system for pumping underground water in the Arkansas River Valley near Garden City, Kans. A steam turbine-driven electrical plant generates the electricity for operating pumps at a series of wells discharging into a conduit leading into a distributing canal covering land on the north side of the Arkansas River in the vicinity of Deerfield. The generator plant, transmission line, wells, pump houses, and conduits are completed, and a portion of the pumps are installed and in operation.

INSTALLATION OF PUMPS

The ten 9-inch centrifugal pumps of 5-second-foot capacity attached to their 25-horsepower electric motors furnished under the first contract have been installed and put in operation. On January 27 a contract was entered into for furnishing thirteen 10-inch centrifugal pumps of 5-second-foot capacity attached to 25-horsepower electric motors. A portion of these pumps were received on the project June 10, 1908, and three of them were installed and put into operation. It is anticipated that all of the pumps will be received and installed during July, 1908.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Garden City project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
111	D'Olier Engineering Co.....	Electric power plant....	\$46,300.00	\$46,300.00	Mar. 15, 1907
124	Camden Iron Works.....	Pumping apparatus.....	14,440.00	9,510.00	May 3, 1907
145	Kansas Portland Cement Co.....	Cement.....	8,000.00	8,167.90	May 1, 1907
215	Buffalo Steam Pump Co.....	Pumps.....	35,700.00	.....	May 31, 1908

* Completed.

LANDS OPENED FOR IRRIGATION

On March 6, 1908, approved plats of 5 townships, designating about 10,656 acres of land irrigable under the Garden City project, were forwarded to the General Land Office with the following public notice:

PUBLIC NOTICE, DATED MARCH 6, 1908

In pursuance of the provisions of section 4 of the reclamation act of June 17, 1902 (32 Stat. L., 388), notice is hereby given as follows:

Water will be furnished from the Garden City project in Kansas under the provisions of the reclamation act in the irrigation season of 1908 for the irrigable land shown upon plats of townships 23 and 24 south, ranges 32, 33, and 34 west, 6th P. M., approved March 2, 1908, by the Secretary of the Interior, and on file in the local land office at Dodge City, Kansas.

The limit of area for which water-right application may be made for lands in private ownership shall be 160 acres of irrigable land for each landowner.

The charges which shall be made per acre of irrigable land which can be irrigated by the waters from the said irrigation project are in two parts, as follows:

1. The building of the irrigation system, \$35 per acre of irrigable land, payable in not less than five nor more than ten annual installments, each not less than \$3.50 per acre.

2. For operation and maintenance, which will as soon as data are available be fixed in proportion to the amount of water used, with a minimum charge per irrigable acre whether water is used thereon or not. The operation and maintenance charges for the irrigation season of 1908 and until further notice will be \$2.75 per acre of irrigable land whether water is used thereon or not, and I hereby establish the regulation that no water will be furnished in any year until the portion of the installment for operation and maintenance for the preceding years have been paid. This will apply to the irrigation season of 1909 as to these charges for 1908.

The first installment on account of said charges for all irrigable areas shown on these plats, whether or not water-right application is made therefor or water is used thereon, shall be due at the local land office at Dodge City, Kans., on December 1, 1908.

The portion of the installment for the building charge for subsequent years shall be due on December 1 of each year at the same place, and until further notice the portion for operation and maintenance, \$2.75 per acre of irrigable land per annum, shall be due at the same time and place.

The charges herein provided for may, for the convenience of applicants, be paid to and received by the special fiscal agent of the United States Reclamation Service at Garden City, Kans., for transmission to the receiver of the United States land office at Dodge City, Kans., on or before the dates specified herein for payments at the local land office.

INSTRUCTIONS ACCOMPANYING PUBLIC NOTICE

This notice was accompanied by request that the local land officers be instructed to announce that water-right applications must be filed in the proper form in the local land office before water can be furnished; that the United States will operate and maintain a power and pumping plant and the cost thereof will be covered by the operation and maintenance charges for the project; that the necessary distributing system will be operated and maintained by the water users to be served therefrom at their own expense under regulations to be approved by the Secretary; that no water will be furnished in 1909 until the operation and maintenance charges for 1908 have been paid; that the amount of water to be furnished, to be stated in the second paragraph of every application, is 2 acre-feet per acre per annum; that the building charge and number of installments are to be stated in the third paragraph of each application, and that contract has been entered into with the Finney County Water Users' Association, and the certificate of that association forming part of the water-right application must be filled in before the application can be accepted.

SETTLEMENT

The 10,656.41 acres of land opened by the public notice of March 14, 1908, are all in private ownership. Twenty-five water-right applications covering 2,507 acres of land have been made.

General agricultural crops grown in large tracts and farmed after customary methods for such crops will not pay a large return on the cost of pumping irrigation water. It is necessary to divide land into small holdings and to cultivate special crops, such as melons, sweet potatoes, fruit, or sugar beets in order to realize profitable results. In communities that have been accustomed to the cultivation of forage crops by the more or less uncertain methods of a semi-humid region, it is probable that a complete revision of agricultural methods may be necessary. It is believed that some such evolution will take place on the Garden City project, and that as it progresses it will be advantageous for the farmers to reduce the size of their farms, thus offering opportunities for additional settlers.

OPERATION

The Garden City project began the delivery of water for irrigation purposes on April 1, 1908. It soon became apparent that the wells on the north side of the Arkansas River would not yield the estimated quantity of water, and on account of the delay in the delivery of additional pumps it was impossible to increase the supply of pumped water before June 30. After the wells were put into operation it was necessary to clean them of incoming sand at intervals.

From the experience of the present season it is apparent that canals that have taken on a coat of silt should not be disturbed except when absolutely necessary for the purpose of cleaning out deposits. The removal of the silt takes away an impervious skin and opens up the porous soil underneath through which the clear water pumped from the wells percolates at a high rate. If canals must be cleaned the work should be done if possible at that season of the year when floods

f muddy river water are likely to occur, so that the silt coating can be estored at the earliest possible date. Pumped water is so expensive, even under very favorable conditions, that a high duty is imperative. In porous soils a high duty can not be obtained when irrigating with a small head of water. In such soils it is necessary to turn on a large head and rush the water over the ground before it has time to sink into the porous substratum.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Inventories:			
Government animals.....	\$385.00		\$10,204.60
Equipment in use.....	6,285.07		
Storehouse.....	2,219.55		
Cement.....	205.00		
Fuel.....	1,202.07		
Cost of work:			
Building cost.....	321,535.45		
Plus adjustments.....	5,087.05		
Less accrued revenues.....		\$70.56	
	326,622.50	70.56	\$26,551.94
Operation and maintenance cost.....	7,539.08		7,539.08
Total.....			344,387.71
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		2,176.71	\$2,807.28
Unpaid purchases.....		2,361.13	
Unpaid contract estimates.....		31,552.08	
Unpaid contract holdbacks.....		3,767.50	
Unpaid freight and express.....		12,515.35	
Unpaid passenger fares.....		239.76	
Unpaid land agreements.....		194.75	
Investment of the United States:			
Disbursement vouchers.....		288,611.22	
Collection vouchers.....	647.55		
Transfer vouchers received.....		7,260.55	
Transfer vouchers issued.....	3,643.79		
	4,291.34	295,871.77	\$21,580.43
Total.....			344,387.71

Total costs to June 30, 1908, distributed to principal physical features

Power station:	
Power house and generating machinery.....	\$78,998.53
Power-house accessories.....	20,564.52
Transmission line and electrical installation.....	15,017.33
Pumping stations:	
Pump houses and pumping units.....	53,853.50
Supply wells.....	51,345.92
Canal system:	
Earthwork.....	58,803.41
Structures.....	29,850.92
Real estate (rights and property).....	1,315.13
Buildings (offices, dormitories, warehouses, etc.).....	4,147.87
Irrigable lands (farm units, subdivision).....	243.66
Administration of project as a whole.....	7,343.60
Cost ledger inventories.....	51.06

Total building cost as per debit in cost of work in statement
of assets and liabilities..... \$21,535.45

MONTANA

BLACKFEET PROJECT (INDIAN SERVICE)

GENERAL STATEMENT

The principal data relating to the Blackfeet project are summarized as follows:

County: Teton.

Township: 31 to 34 N., Rs. 5 to 10 W., M. M.

Irrigable area: 37,000 acres. Ownership, Indian lands.

Average elevation of irrigable area: 3,875 feet above sea level.

Average annual rainfall on irrigable area: About 16 inches.

Range of temperature on irrigable area: Maximum, 100°; minimum, -50°.

Character of soil of irrigable area: Rich, sandy loam.

Principal products: Hay, grain, potatoes, cattle, and horses.

Railroad station: Opal, Mont.

Railroad: Great Northern.

Principal markets: Local use.

Watershed area: 368 square miles.

Average annual rainfall on watershed: About 60 inches.

Estimated annual run-off of watershed: 400,000 acre-feet; 95 per cent from April to October.

Reservoirs: Two Medicine Lake, area, 723 acres; capacity, 9,886 acre-feet. Spring Lake, area, 1,400 acres; capacity, 29,000 acre-feet.

Storage dams: Two Medicine Lake, type, rock-fill crib; height, 30 feet; length, 435 feet. Spring Lake, type, earth fill; height, 25 feet; length, 1,700 feet.

Main canals: Length, 59 miles.

Laterals: Length, 104 miles.

The irrigation plan of the Blackfeet project involves the construction of five irrigation systems on the Blackfeet Indian Reservation, as follows: Carlow canal system, heading on the right bank of Cut Bank Creek, in sec. 35, T. 34 N., R. 10 W., to irrigate about 20,000 acres of land near Carlow station, on the Great Northern Railway; Cut Bank canal system, heading on the left bank of Cut Bank Creek, in sec. 28, T. 34 N., R. 8 W., to irrigate about 24,000 acres, 11,000 acres of which would be outside of the reservation and directly north of the town of Cut Bank; Two Medicine canal system, diverting from the left bank of Two Medicine River, in sec. 23, T. 31 N., R. 10 W., to irrigate about 37,000 acres; Badger-Fisher canal system, in sec. 19, T. 30 N., R. 9 W., diverting from the right bank of Badger Creek, to irrigate an area of 34,000 acres located between Birch and Badger creeks; and Birch Creek canal system, diverting from Birch Creek, in sec. 22, T. 29 N., R. 8 W., to irrigate about 5,000 acres between Birch and Blacktail creeks. The Two Medicine canal system has been selected for first construction owing to its excellent water supply and storage facilities.

AUTHORIZATION

By an act of the Fifty-ninth Congress, second session (Public No. 154) an appropriation of \$300,000 was made, \$100,000 of which was to be immediately available, for the construction of irrigation systems

on the Blackfeet Indian Reservation, Mont. Under a plan for co-operation between the Office of Indian Affairs, in control of the appropriation, and the United States Reclamation Service, in direct charge of the work, all investigations and construction are being carried on by the Reclamation Service.

TWO MEDICINE UNIT

Two Medicine River, from which the water supply for the Two Medicine canal system is taken, rises in Two Medicine Lake, situated on the east slope of the Two Medicine Pass of the Continental Divide. The main canal will have a length of 43 miles and a capacity of 200 second-feet for 30 miles, thereafter decreasing to a minimum of 50 second-feet at the end. For the first 13 miles, when not used as a distributing canal, it will act as a feed canal for Spring Lake distributing reservoir, a natural depression supplemented with an earth dam having a maximum height of 25 feet. This reservoir will impound about 29,000 acre-feet, from which the south branch canal will draw its supply. The south branch canal will have a length of 16 miles and a capacity of 170 to 100 second-feet. In order to supplement the low-water flow during October, a rock-filled crib dam, having a maximum length of about 435 feet and a maximum height of 30 feet, will be built at the outlet of Two Medicine Lake. This will create a storage of about 10,000 acre-feet, which amount can be increased, if required, by increasing the height of the dam. A small brush diversion dam on Two Medicine River will be required to furnish the maximum flow in the main canal during the low-water stage of the river. The headgates and the structures on the main canal will, in general, be constructed of timber. Concrete outlet pipes and valve pits will be provided for the control of Spring Lake reservoir.

LOCATION

The irrigable area covered by the Two Medicine canal system is located in the east central portion of the reservation. The main canal heads just below the confluence of Little Badger Creek with the Two Medicine River and continues in a northeasterly direction to the irrigable areas, called "Flat Coulee" and the "Carlow flats," which are on the southeast slope of Cut Bank Creek. This tract has an area of some 70,000 acres and extends about 15 miles along the creek with an average width of about 6 miles. A fair estimate of the irrigable land is about 37,000 acres, of which about 20,000 acres are under the main canal and about 17,000 acres under the south branch canal. The lands under the main canal are contiguous to and directly east of the town of Cut Bank and are bisected by the Great Northern Railway.

ENGINEERING DIFFICULTIES

The greater part of the system can be easily and economically constructed and will require very few structures. In the first 10 miles of the main canal, where the line parallels the Two Medicine River before passing through the gap in the main divide between Two Medicine Valley and the Flat Coulee slope, there occurs, however,

some very difficult and expensive sidehill construction. Owing to the steepness of the slopes and the disintegrating character of some of the material, it is probable that bench flumes will have to be constructed over the worst sections and that the canals will have to be in thorough cut for the remainder of the steep sidehill work.

METHOD OF DOING WORK

Owing to the probability that not over one-half of the lands will require water during the first ten years, it has been decided to construct the main canal at first with only one-half capacity, except where it will be economical to construct it with full capacity, as in some of the steep sidehill work. No part of the main canal, however, will be constructed with a capacity less than 50 second-feet, nor any part of the south branch canal with a capacity less than 75 second-feet, owing to their having laterals of these capacities. The laterals will be built with full capacity. The canal locations are made with respect to ultimate capacity, the water surface is used as a grade, and only sufficient material is excavated below this to give the cross-section area required. To complete the canal to final capacity the remaining material left in the bottom of the prism will be excavated and placed on the banks. Indian teams and Indian labor will be used in the construction of the canals, the work being done either by force account or at unit prices, and local supplies will be purchased from the Indians whenever practicable.

TIME OF BEGINNING AND COMPLETING THE TWO MEDICINE UNIT

Preliminary construction surveys were started on May 1, 1908. The preliminary location of the main and south branch canals has been completed and final location is well under way. Headquarters buildings are being constructed and division and construction camp buildings will be erected as required. Excavation of the main canal will be started about July 20, 1908. The unit should be completed by the fall of 1910 in accordance with the initial construction outlined.

CHARACTER OF LAND

Practically all of the irrigable land is of an excellent grade of brown sandy loam, underlain with gravel at from 1 to 4 feet below the surface. Very little gravel occurs on the surface of the ground, and the soil is practically free from alkali. Without irrigation the land produces good crops of hay and affords excellent pasturage; with irrigation it yields especially good crops of hay, alfalfa, grain, and potatoes. The topography is such that the land can be irrigated with very little leveling or preparatory work. The principal tract of land under the main canal has a smooth, unbroken surface, with a uniform slope of about 20 feet per mile toward the south-east. The land under the south branch canal is somewhat rolling and cut by frequent coulees and hogbacks, but otherwise has a smooth surface and fairly uniform slope. All of the irrigable lands are free from sagebrush, grease wood, and other brush or timber.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Cost of work:			
Building cost.....	\$5,734.40		\$5,734.40
LIABILITIES.			
Investment of the United States:			
Disbursement vouchers.....		\$7,834.32	
Collection vouchers.....	2,641.67		
Transfer vouchers received.....		571.25	
Transfer vouchers issued.....	29.50		
	2,671.17	8,405.57	5,734.40
Total.....			5,734.40

Total cost to June 30, 1908, distributed to principal physical features

Survey and design..... \$5,734.40

CROW RESERVATION PROJECT (INDIAN SERVICE)

The Crow Indian Reservation is located in southeastern Montana. The principal streams running through the reservation are the Big Horn and Little Big Horn rivers and Pryor Creek, all of which have a northerly direction and are tributary to Yellowstone River. A number of canals constructed by the Office of Indian Affairs are at present in operation and cover an irrigable area of about 50,000 acres. Big Horn Indian canal heads at the mouth of Big Horn Canyon on the right bank of the Big Horn River. The elevation of the headworks of this canal is such that at a low-water stage no water is delivered to the canal. A survey has been made for what is known as the "Big Horn high-line canal" heading in the river above the present Indian canal, but on the opposite side of the river. The intake of this canal was about 135 feet above mean low water, and the survey developed the fact that an elevation of about 75 feet above mean low water would cover nearly the same amount of land and require a much less expensive dam. In 1907 this low-line canal, called the "Big Horn west canal," was surveyed by the Office of Indian Affairs. The dam necessary to divert water into the canal will be 130 feet long at the bottom of the river, 250 feet long at the top, and 90 feet in height above the bed of the stream. The proposed canal will have a capacity of about 300 second-feet, a length of 36 miles, a number of wooden flumes, and 3 concrete inverted siphons, one at Beauvais Creek, one at Woody Creek, and one at Two-Legging Creek, having, respectively, lengths of 3,200 feet, 3,500 feet, and 4,500 feet. The dam besides supplying water to this canal could be made to furnish an additional supply for the Big Horn Indian canal by means of the construction of a short tunnel.

The Big Horn River discharges approximately 3,000,000 acre-feet of water per annum. The water rights on the stream at present include an appropriation of 400 second-feet for the Big Horn Indian canal and 400 second-feet for the Fort Custer canal in addition to the

various diversions from the stream in Wyoming. Future arrangements for diversion of stored waters from the Shoshone reservoir, now under construction in connection with the Shoshone project, are possible. Preliminary surveys have been made on this project during the present fiscal year under the cooperative arrangement of the Office of Indian Affairs and the Reclamation Service amounting in cost to \$15.74.

FLATHEAD PROJECT (INDIAN SERVICE)

GENERAL STATEMENT

The principal data relating to the Flathead project are summarized as follows:

Counties: Flathead, Sanders, and Missoula.

Townships: 15 to 24 N., Rs. 18 to 25 W.

Irrigable area: 130,000 acres. Ownership, Indian lands.

Average elevation of irrigable area: 2,800 feet above sea level.

Range of temperature on irrigable area: Maximum, 100°; minimum, -20°.

Character of soil of irrigable area: Clay, forest loam, and gravelly loam.

Principal products: Alfalfa, grain, vegetables, apples, and small fruits.

Railroad stations: Evaro, Arlee, Ravalli, Dixon, and Perma, Mont.

Railroad: Northern Pacific.

Principal markets: Local mining and lumber camps.

The irrigation plan of the Flathead project will provide for the irrigation of about 130,000 acres in various parts of the Flathead Indian Reservation. Water will be taken by simple diversion works from the Jocko River and several creeks rising in the Mission Mountains, the late summer flow being supplemented by storage in several reservoirs, of which Lakes St. Mary and McDonald will form two, and by pumping from the Pend Oreille River. The falls of the Pend Oreille River afford opportunity to develop much more power than is necessary to irrigate the arable land within reach. Studies are being undertaken to learn the amount of and best method of utilizing this power. The fall is about 240 feet in 6 miles, and the minimum natural flow last winter was 2,500 second feet, but the average flow is much larger.

AUTHORIZATION

By an act of the Sixtieth Congress, first session (Public No. 104), an appropriation of \$50,000 for preliminary surveys, plans, and estimates of irrigating systems to irrigate the allotted lands of the Indians of the Flathead Reservation in Montana and the unallotted irrigable lands to be disposed of under the act of April 23, 1904, and entitled "An act for the survey and allotment of lands now embraced within the limits of the Flathead Indian Reservation in the State of Montana, and the sale and disposal of all surplus lands after allotment," and to begin the construction of the same. The cost of the entire work is being reimbursed from the proceeds of the sale of the land within the reservation.

SURVEYS

Reconnaissance surveys were begun in 1907, and in June, 1908, two parties began work, one in Jocko River Valley, where about 11,000 acres of land may easily be reached from the Jocko River, and the

other in the Mission Creek Valley, where there are about 20,000 acres of arable land. Work is being pushed on these tracts where the problems of construction are the simplest, and it is expected to have portions of each of the areas ready for construction of canal systems in the spring of 1909. Work is also being done in determining the available water in the smaller streams and the lands that may be covered. Allotments have been made to the Indians in many widely separated parts of the reservation, and many small irrigation plants will be required to reach all lands that are susceptible of irrigation.

FINANCIAL STATUS AND FEATURE COSTS

Assets and Liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Inventories:			
Equipment in use.....	\$349. 35		\$349. 35
Cost of work:			
Building cost.....	4,533. 25		
Plus adjustments.....	193. 48		
Less accrued revenues.....		\$2. 00	
	4,726. 73	2. 00	4,724. 73
Total.....			5,074. 08
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		878. 67	1,088. 37
Unpaid purchases.....		42. 48	
Unpaid freight and express.....		56. 62	
Unpaid passenger fares.....		110. 60	
Investment of the United States:			
Disbursement vouchers.....		3,252. 16	3,985. 71
Transfer vouchers received.....		733. 55	
Total.....			5,074. 08

Total cost to June 30, 1908, distributed to principal physical features

Preliminary surveys..... \$4,533. 25

HUNTLEY PROJECT

GENERAL STATEMENT

The principal data relating to the Huntley project are summarized as follows:

County: Yellowstone.

Townships: 2 to 3 N., Rs. 27 to 31 E., M. M.

Irrigable area: 28,921 acres. Ownership, mainly public.

Average elevation of irrigable area: 2,950 feet above sea level.

Average annual rainfall on irrigable area: 10 to 15 inches.

Range of temperature on irrigable area: Maximum, 100°; minimum, -35°.

Character of soil of irrigable area: Varying from light sandy loam to heavy clay.

Duty of water: 2½ acre-feet per acre per annum.

Size of farm units: 40 to 80 acres.

Principal products: Alfalfa, forage, sugar beets, vegetables, apples, and small fruits.

Railroad stations: Huntley and Ballantine, Mont.
 Railroads: Northern Pacific and Chicago, Burlington and Quincy.
 Principal markets: Chicago, Ill.; St. Paul, Minn.; Omaha, Nebr.; Denver, Colo.; Butte and Billings, Mont.
 Watershed area: 11,180 square miles.
 Reservoir: None.
 Main canals: Length, 30 miles.
 Laterals: Length, 156 miles.
 Power development: 600 horsepower.
 Construction of project authorized: April 18, 1905.
 Per cent of project completed: 99.5.

A detailed description of the Huntley project will be found in the sixth annual report, and general description relating to the project are given in the third, fourth, and fifth annual reports. Briefly, the irrigation plan of this project involves the construction of a diversion canal taking water from the south side of Yellowstone River at a point about 3 miles above Huntley, Mont., and covering lands in the Yellowstone Valley lying below Huntley. At a drop in the main canal, situated about 14 miles from the head thereof, is located a hydraulic pumping plant pumping water onto high lands in the vicinity of the plant. A future extension both of the gravity and the pumping systems is contemplated. The irrigation works of the present system on the project, with the exception of completing the testing of the pumping plant, have been completed. The tests of the pumping plant were initiated at the beginning of the irrigation season of 1908 and were nearly completed at the close of the fiscal year.

DETAILS OF IRRIGATION SYSTEM

The Huntley main canal is about 23 miles long, and the high line canal is about 7 miles long. These two canals are the backbone of the system, and from them are taken 21 lateral canals, which, with their branches, aggregate 156 miles in length and deliver water to each farm unit. The headworks of the main canal are substantially built of reenforced concrete and take water from an elevation practically coincident with the bottom of Yellowstone River. The Yellowstone River carries 3,000 to 30,000 second-feet of water during the irrigating season, and the main canal is designed for a normal capacity of 400 second-feet. Division 1 of the main canal includes three tunnels 700, 1,550, and 400 feet long, respectively. These tunnels are 9.2 feet wide and 9 feet high and are lined with concrete. There are 700 feet of concrete-lined canal in division 1, as well as a massive reenforced-concrete wasteway at the head of tunnel No. 3. Practically all structures such as lateral turnouts and culverts on the main canal are constructed of concrete, but most of the small turnouts and structures on the lateral system are made of wood. The wooden structures are constructed of native or Douglas fir, and are built to be as durable as possible with this character of material. A system of waste-water ditches aggregating 67 miles in length, designed to keep the water table from rising in the alkali districts and to provide passage for storm water across the flat valley lands, has been built.

The first drop in the main canal is about 1 mile east of Ballantine and has been utilized to develop power for pumping to bench lands.

The main canal drops about 34 feet, the water passing through two vertical turbines having 20-inch centrifugal pumps attached to the same shaft and taking water from the supply to the turbines. The pumped water is forced up about 45 feet to the high-line canal. Each pump has a normal capacity of 28 second-feet. The power house, fore bay, and water pipes are constructed of reenforced concrete. The pumping plant has been in operation since early in May, 1908, and promises to be a most satisfactory and economical installation. A second drop in the main canal would develop some power during the irrigation season, but is not at present utilized.

A water-right filing has been made in proper form, appropriating 750 second feet from Yellowstone River for irrigating, power, and domestic purposes; this with the beneficial use of the water creates a perfect water right that will attach to the project lands.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ended June 30, 1908:

Principal contracts, Huntley project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
59	W. D. Lovell.....	Main canal, structures.....	\$38,768.50	\$60,529.58	June 1, 1907
65	Illinois Steel Co.....	Cement.....	7,700.00	\$7,813.50	.....
70	W. D. Lovell.....	Main canal, excavation, schedule 2.	48,245.00	\$57,339.04	May 1, 1907
88	Hughes & Olson.....	Main canal, excavation, schedule 1.	170,800.00	\$162,587.69	May 31, 1907
113	Illinois Steel Co.....	Cement.....	7,187.50	\$7,187.50	Apr. 1, 1907
114	Hughes & Olson.....	Main and high-line canals, excavations, schedule 3.	77,610.00	\$72,729.23	May 15, 1907
121	Camden Iron Works.....	Pumping plant.....	12,675.00	12,675.00	May 2, 1908
155	Universal Portland Cement Co.	Cement.....	8,000.00	8,000.00	Dec. 31, 1907

* Completed.

LANDS OPENED FOR IRRIGATION

On May 21, 1907, approved plats of seven townships, designating about 28,921 acres of land irrigable under the Huntley project, were forwarded to the General Land Office with the following public notice:

PUBLIC NOTICE DATED MAY 21, 1907

In pursuance of the provisions of section 5 of the act of April 27, 1904 (33 Stat. L., 352), and of section 4 of the reclamation act of June 17, 1902 (32 Stat. L., 388), notice is hereby given that water will be furnished from the Huntley project in Montana at the opening of the irrigating season of 1908 for lands designated upon farm unit plats of: T. 2 N., R. 27 E.; T. 2 N., R. 28 E.; T. 2 N., R. 29 E.; T. 2 N., R. 30 E.; T. 3 N., R. 28 E.; T. 3 N., R. 29 E.; T. 3 N., R. 30 E.; approved by the Secretary of the Interior and on file in the local land office, Billings, Mont., and that the lands will be opened to entry and settlement in accordance with the President's proclamation of May 21, 1907, and departmental order of the same date.

The limit of area per entry representing the acreage which, in the opinion of the Secretary of the Interior, may be reasonably required for the support of a family on the lands in question is fixed for the lands entered, subject to the provisions of the reclamation act, at the amounts shown upon the plats for the several farm units.

The limit for which water-right application may be made for lands which were included in Indian allotments shall be 160 acres of irrigable land for each landowner.

The charges which shall be made per acre of the lands included in said entries and for lands in private ownership which can be irrigated by the waters of the said irrigation project are in three parts, as follows:

1. The charges of \$4 per acre, to be paid to the Indians for the total area in each entry as required by section 5 of the act of April 27, 1904, \$1.00 per acre to be paid when entry is made and the remainder in four equal annual installments, the first to be paid at the end of the second year.

2. The building of the irrigation system, \$30 per acre of irrigable land, payable in not less than five nor more than ten annual installments, each not less than \$3 per acre, the first installment to be paid when entry is made.

3. For operation and maintenance, which will, as soon as the data are available, be fixed in proportion to the amount of water used, with a minimum charge per irrigable acre whether water is used thereon or not. The operation and maintenance charges for the irrigation season of 1908, and for other irrigation seasons until further notice, will be 60 cents per acre of irrigable land.

The first installment of said charges for all irrigable areas shown on these plats, whether or not water-right application is made therefor or water is used thereon, shall be due and payable when entry is made, at the local land office at Billings, Mont., being not less than \$4.60 per acre of irrigable land and \$1.00 per acre of non-irrigable land.

The subsequent annual payments of 75 cents per acre for the entire area of each entry will begin at the end of the second year after entry and will be due and payable at the local land office at that time and at the expiration of each year thereafter. The second installment of the building charge for each acre of irrigable land shall be due and payable at the same place on or before December 1, 1909, and for the subsequent years on or before December 1 of each year; and the operation and maintenance charge for the irrigable area shall become due as announced by the Secretary of the Interior each year.

INSTRUCTIONS ACCOMPANYING PUBLIC NOTICE

The lands of this project were withdrawn for reclamation under the act of June 17, 1902 (32 Stat. L., 388), in pursuance of the provision of the act of April 27, 1904 (33 Stat. L., 352), amending and ratifying agreement by which Indians of the Crow Indian Reservation ceded the lands to the United States. The method of opening the lands to entry was fixed by the President's proclamation of May 21, 1907, and departmental order of the same date.

In transmitting the public notice to the General Land Office directions were given that the local land officers be instructed to give publicity to the notice and to announce that water-right applications must be filed in proper form in the local land office before water can be furnished; that the United States will maintain and operate the diversion dams and main headworks, the main canals and main laterals, as shown on the plat of the project approved by the Director of the Reclamation Service on file in the office of the engineer in charge of the project; that the sublaterals constituting the balance of the distributing system are to be maintained by the water users to be served therefrom at their expense under regulations to be approved by the Secretary of the Interior; that the amount of water to be furnished, which must be stated in the second paragraph of every

application, is 2½ acre-feet per acre per annum; that the building charge and number of installments are to be stated in the third paragraph of each application; and that no water users' association has been established under this project, and therefore the certificate of the association forming a part of the application can not be filled in.

SETTLEMENT

The opening of the project took place on June 26, 1907, following the registration of intending settlers and a drawing conducted on the day previous. On July 22 settlers began filing on the lands in order of their numbers, and on August 23 the project lands were thrown open to unrestricted entry under the terms of the reclamation act. Of the 28,921.44 acres of land, containing 585 farm units, opened to settlement by the public notice of May 21, 1908, 238 units had been entered at the close of the fiscal year, covering 10,675.60 acres. Of the area opened, 25,812.58 acres are public and the remainder is covered by preference rights and Indian allotments.

Public lands withdrawn pending extension of the main canal and high-line canal include 13,296.95 acres. Within the boundary of this withdrawal are 1,504.76 acres of Indian allotments. Out of the total of 14,801.71 acres there will be about 4,000 acres irrigable. Therefore, when the extension work is completed, there will be about 33,000 acres of irrigable land included in the Huntley project.

People, largely from the Middle and Western States, have settled on the lands and are improving them as rapidly as possible, and some very good houses and improvements are being built on the farms. About 4,100 acres have been plowed and put in crop for the season of 1908 and over 400 acres irrigated for meadow; this represents about half of the land filed on in time for a crop during 1908. Water is being delivered to these lands and some fine showings are being made.

TOWN SITES

The Huntley project town sites were surveyed during the spring of 1907 and platted, and certified copies of the field notes prepared. The official plat was approved by the Commissioner of the General Land Office and the Secretary of the Interior on August 2, 1907. A board of three appraisers was appointed and a portion of the lots in each town site offered for sale.

By June 30, 1908, there had been sold 32 lots in Huntley, bringing \$10,385; 2 lots in Ballantine, bringing \$700; and 1 lot in Osborn, bringing \$125. At the remaining town sites of Worden, Newton, Anita, Pompey's Pillar, and Bull Mountain there have been no lots sold, as settlement of the project has not proceeded sufficiently to require the opening of these towns. At Huntley there has been a substantial growth, and a good business is being done by the merchants located at that point.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected water-right building charges.....	\$944.37		\$1,133.55
Uncollected water-right operation and maintenance charges.....	189.18		
Inventories:			
Government animals.....	2,916.83		9,944.23
Equipment in use.....	6,004.30		
Storehouse.....	1,023.10		
Cost of work:			
Building cost.....	809,906.08		803,168.07
Plus adjustments.....	25,700.79		
Less accrued revenues.....		\$412.00	
Less accrued repayments.....		32,026.80	
	835,606.87	32,438.80	
Operation and maintenance cost.....	5,809.20		Cr. 714.06
Less accrued revenues.....		118.50	
Less accrued repayments.....		6,405.36	
	5,809.20	6,523.86	
Total.....			813,531.19
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		2,186.61	12,162.01
Unpaid purchases.....		3,065.39	
Unpaid contract estimates.....		2,569.94	
Unpaid contract holdbacks.....		3,168.75	
Unpaid freight and express.....		507.92	
Unpaid passenger fares.....		19.80	
Unredeemed coupon books.....		43.60	
Investment of the United States:			
Disbursement vouchers.....		855,695.87	801,369.18
Collection vouchers.....	54,334.49	19,033.97	
Transfer vouchers received.....	19,026.17		
Transfer vouchers issued.....			
	73,360.66	874,729.84	
Total.....			813,531.19

Total cost to June 30, 1908, distributed to principal physical features

Main canal:		
Pryor Creek Improvement.....		\$19,134.39
Earthwork—		
Division No. 1.....		195,357.93
Division No. 2.....		70,786.03
Division No. 3 and high line.....		90,907.90
Structures—		
Miscellaneous.....		91,435.65
Pipe culverts, division No. 3.....		855.40
Bridges and culverts.....		2,531.41
Distributing system (earthwork and structures).....		245,916.30
Power plant (building and machinery).....		69,069.25
Buildings (offices, dormitories, warehouses, etc.).....		13,389.71
Experimental farm.....		1,467.53
Telephone system.....		9,034.58
Total building cost as per debit in cost of work in statement of assets and liabilities.....		800,906.08

MADISON RIVER PROJECT

A general description of the Madison River project will be found in the fifth annual report. A part of the irrigable lands withdrawn in connection with this project was restored to entry during the fiscal year. The expenditures on the project for the fiscal year have been for advertising, amounting to \$18.57, making a total expenditure to June 30, 1908, of \$10,588.47.

MILK RIVER PROJECT

GENERAL STATEMENT

The principal data relating to the Milk River project are summarized as follows:

Counties: Chouteau and Valley.

Townships: 27 to 33 N., Rs. 16 to 40 E., M. M.

Irrigable area: 200,000 acres. Ownership, 10 per cent public, remainder private.

Average elevation of irrigable area: 2,200 feet above sea level.

Average annual rainfall on irrigable area: 12 inches.

Range of temperature on irrigable area: Maximum, 90°; minimum, —45°.

Character of soil of irrigable area: Loam and gumbo.

Duty of water: 2 acre-feet per acre per annum at reservoir.

Size of farm units: 160 acres.

Principal products: Hay, grain, and vegetables.

Railroad stations: Glasgow, Hinsdale, Saco, Malta, Harlem, Chinook, and Havre, Mont.

Railroad: Great Northern.

Principal markets: Local.

Watershed area: 24,000 square miles.

Average annual rainfall on watershed: 20 inches.

Estimated annual run-off of watershed: 257,000 acre-feet.

Reservoirs: St. Mary Lakes (see St. Mary project). Chain Lakes, area, 13,422 acres; capacity, 437,560 acre-feet. Nelson Lake, area 6,842 acres; capacity, 190,430 acre-feet.

Storage dams: Chain Lakes, type, earth fill; height, 92 feet; length, 2,110 feet. Nelson Lake, not designed.

Diversion dams: Dodson, type, rock-fill crib with removable crest; height, fixed, 20 feet; height, total, 26 feet; length, 319 feet. Others not designed

Main canals: Length, 275 miles.

Per cent of project completed: 2.6.

A detailed description of the Milk River project will be found in the first annual report, and general descriptions relating to the project are given in the other annual reports. Briefly, the irrigation plan of this project involves the construction of a storage reservoir in the St. Mary Lakes on the St. Mary River near Babb, Mont., a canal for diverting water from a storage reservoir into the north fork of the Milk River, a secondary storage reservoir at Chain Lakes on the Milk River about 12 miles northwest of Burnham, Mont., and diversion dams near Chinook, Dodson, and Vandalia, Mont., for diverting water into canals covering lands in the lower Milk River Valley. The Dodson dam will divert water into two canals, one on each side of the river. The canal on the right side of the stream covers lands on the south side of Milk River and extends to Nelson Lake storage reservoir; and another canal heading in the same reservoir will cover lands on the north side of the river. Some work has been done on the diversion canal leading from the storage reservoir on the St. Mary River to the north fork of the Milk River, and the construction of the Dodson diversion dam and the Dodson south canal connecting the dam with the Nelson Lake reservoir have been authorized.

DODSON DIVERSION DAM

The original design for the Dodson dam contemplated a structure 29 feet high above the bed of the river. New plans recently approved provide for a timber-crib, rock-filled structure with a removable crest. The bed of the river at the site of the dam has an elevation of 2,259 feet. The elevation of the fixed crest of the dam is to be 2,279 feet, and at the top of the removable crest the elevation will be 2,285 feet. The removable crest is to be a modified form of a Poiree needle dam. According to hydrographic records of the discharge of Milk River since 1898, the maximum elevation of the flood discharge passing over the crest with needles removed will not exceed 2,285 feet.

The original plans made necessary a considerable change in the track of the Great Northern Railway above the Dodson diversion dam, the estimated cost of the change being \$50,000. Under the revised plans only 6,000 feet of track will have to be raised 5 feet in elevation, and the bank exposed to water ripped below the 2,285-foot contour.

DODSON SOUTH CANAL

The Dodson south canal, as designed, will be 42 miles long, extending from the Dodson diversion dam to Nelson Lake reservoir, formerly known as "Mud Lake reservoir." The canal will be 100 feet wide on the bottom and 5 feet deep, and will have an average fall of 1 foot to the mile. The capacity will be 1,250 second-feet. It will be constructed as a one-bank flood canal, and is to carry up to its capacity the flood waters of the Milk River and any run-off from side drainage areas that the canal crosses. This canal from its head to Malta divide will be 31 miles long.

ADJUSTMENT OF WATER RIGHTS

A reference in the sixth annual report was made to certain necessary litigation in connection with the private canals diverting from Milk River in the vicinity of Chinook and Harlem and above the proposed Dodson diversion. In the case there alluded to in behalf of the Fort Belknap Indians, the United States Supreme Court has sustained the decisions of the lower courts, giving to the Indians of the Fort Belknap Indian Reservation 5,000 miner's inches or 125 second-feet of the waters of Milk River and also giving them priority over all private canals from Milk River. At the time authority was given in March, 1908, for construction work on this project, it was understood that a general adjudication of the rights of all private canals would be necessary in order to determine the order of their priorities, but more especially to establish the amount of water to which each ditch was entitled. In order to avoid the expense and delay that would necessarily result from an adjudication of these rights by suits at law, as well as to expedite the construction of the Dodson system, certain articles of agreement were drawn under date of May 28, 1908, between various private canal companies in the vicinity of Chinook and Harlem, parties of the first part, the Upper and Lower Milk River Water Users' Associations, parties of the second part, and the United States, party of the third part. This agreement provides in effect that as soon as an adequate supply of water shall be provided in the channel of Milk River from St. Mary

River, or elsewhere, the owners of the various private canals will execute and deliver to the United States conveyances of their present water rights, dams, ditches, reservoirs, and structures covering lands in the Milk River Valley susceptible of irrigation from the proposed government irrigation system. In consideration of such conveyance the several ditch owners shall receive a credit upon the charge for water delivered to the lands under such system amounting to \$12.50 per acre for all lands under their said canals that have heretofore been irrigated and that are included in the irrigation project of the Reclamation Service. The agreement further provides that the present appropriations of the ditch owners shall be measured by the maximum capacities of their ditches as estimated in the following table and that the acreages hitherto irrigated shall be considered those shown in the table.

Company.	Canal capacity.	Acres irrigated.
	<i>Second-feet.</i>	
Fort Belknap Canal and Irrigation Co.	130	10,900
Winters Anderson Ditch Co.	12	440
Paradise Valley Ditch and Irrigation Co.	19	1,400
New Harlan Irrigation Co.	73	7,820
Cooks Irrigation Co.	50	2,700
Matheson Ditch Co.	28	1,715
West Fork Ditch Co.	13	800
Fort Belknap Indian Canal.	125	.....
Total.....	450	25,775

This agreement has not yet been fully executed by the local irrigation interests. It will be submitted for the consideration of the director and the Secretary of the Interior as soon as it has been executed by the first and second parties.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Inventories:			
Government animals.....	\$1,000.00		\$3,403.29
Equipment in use.....	1,747.40		
Storehouse.....	655.89		
Cost of work:			
Building cost.....	92,919.05		99,746.89
Plus adjustments.....	6,827.84		
Total.....			103,150.18
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		\$1,153.21	4,198.18
Unpaid purchases.....		334.39	
Unpaid freight and express.....		2,559.53	
Unpaid passenger fares.....		151.05	
Investment of the United States:			
Disbursement vouchers.....		94,180.58	98,952.09
Collection vouchers.....	150.69		
Transfer vouchers received.....		6,549.58	
Transfer vouchers issued.....	1,627.47		
	1,778.16	100,730.16	
Total.....			103,150.18

*Total cost to June 30, 1908, distributed to principal physical features***Preliminary examination and surveys:**

Hydrography	\$9,520.73
Preliminary surveys	17,343.66
Chain Lake reservoir surveys	2,694.40
Yantic canal surveys	3,947.58
Chinook south canal	561.71
Dodson reservoir surveys	2,863.40
Malta north canal surveys	1,959.26
Malta south canal surveys	10,668.03
Glasgow high-line surveys	2,138.12
Bowdoin reservoir surveys	2,341.08
Mud Lake reservoir surveys	752.49
Beaver Lake reservoir surveys	1,039.83
Bowdoin north canal surveys	1,792.68
Bowdoin south canal surveys	1,792.53
Dodson dam, earthwork (drilling)	2,496.70
Dodson south canal, final location	2,433.14
Administration of project as a whole	28,443.14
Cost-ledger inventories	140.57

Total building cost as per debit in cost of work in statement of
assets and liabilities..... 92,919.05

ST. MARY PROJECT**GENERAL STATEMENT**

The principal data relating to the St. Mary project are summarized as follows:

County: Teton.

Townships: 34 to 37 N., Rs. 1 to 13 W., M. M.

Irrigable area: 100,000 acres. Ownership, public, 75,000 acres; private, 25,000 acres.

Average elevation of irrigable lands: 3,500 feet above sea level.

Range of temperature on irrigable lands: Maximum, 85°; minimum, -45°.

Character of soil of irrigable area: Loam.

Duty of water: 2 acre-feet per acre per annum.

Size of farm units: 160 acres.

Principal products: Forage and grain.

Railroad stations: Browning, Mont.; Cardston and Alberta, Canada.

Railroads: Great Northern and Alberta Railway and Irrigation Company.

Principal markets: Local points.

Watershed area: 452 square miles.

Average rainfall on watershed: 60 inches.

Estimated annual run-off of watershed: 670,000 acre-feet.

Storage reservoir: Area, 7,400 acres; capacity, 150,000 acre-feet.

Storage dam: Type, earth-fill; height, 40 feet; length, 2,070 feet.

Diversion dam: Storage dam used for diversion.

Main canal: Length, 25 miles.

Tunnel: Length, 1,100 feet in one tunnel.

Construction of project authorized: January 15, 1906.

Per cent of project completed: 18.

A detailed description of the St. Mary project will be found in the sixth annual report, and general descriptions relating to the project are given in all of the other annual reports. Briefly, the irrigation plan of this project contemplates the construction of a dam at the outlet of the Lower St. Mary Lake, converting it into a storage reservoir, and a canal taking water from the storage reservoir and distributing it to lands in the eastern part of the Blackfeet Indian Reservation and to lands lying to the east thereof on the headwaters

of the Marias River. A small portion of the diversion canal has been excavated, and the other features of the project remain to be constructed. If satisfactory arrangements can be made with Canada for carrying through Milk River in that country waters diverted from St. Mary River, in the United States, into the headwaters of the Milk River, the irrigation features of the St. Mary project will be abandoned and the storage works and diverting canal as far as the north fork of the Milk River will be constructed for use in connection with the Milk River project.

INTERNATIONAL FEATURES

After several years of correspondence with Canada through the British ambassador regarding the international control of the St. Mary and Milk rivers, two commissioners were appointed last winter, Dr. W. F. King, representing the Canadian government, and the director of the Reclamation Service, representing the United States. A preliminary meeting of the two commissioners was held in Washington in May, 1908. A further conference is to be held in the field, when the two commissioners will go over the ground in detail and study the various engineering and physical features that control the problem.

CONSTRUCTION

During the latter part of 1907 a steam shovel and an Armstrong excavator were used on construction of the main canal. Some difficulty was experienced in handling the material excavated, especially with the steam shovel, but the difficulty was overcome and fair progress was made considering the character of the material encountered.

PRINCIPAL CURRENT CONTRACT

The following table contains data relating to the principal contract in operation or completed during the fiscal year ended June 30, 1908:

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
113	Illinois Steel Co.....	Cement.....	\$360	\$360	Apr. 1, 1907

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected miscellaneous.....	\$15.00		\$15.00
Inventories:			
Equipment in use.....	7,484.57		
Storehouse.....	5,534.91		
Lumber.....	1,283.24		
Fuel.....	24.55		
			14,327.27

Assets and liabilities on June 30, 1908—Continued

Items.	Debits.	Credit.	Amounts.
ASSETS—continued.			
Cost of work:			
Building cost.....	\$219,536.70		
Plus adjustments.....	8,522.97		
Less accrued revenues.....		\$45.00	
	228,059.67	45.00	\$228,014.67
Total.....			242,356.94
LIABILITIES.			
Accounts payable:			
Unpaid freight and express.....		80.55	640.55
Unpaid miscellaneous.....		560.00	
Investment of the United States:			
Disbursement vouchers.....		248,892.53	
Collection vouchers.....	6,969.32		
Transfer vouchers received.....		8,998.45	
Transfer vouchers issued.....	9,205.27		
	16,174.59	257,890.98	241,716.39
Total.....			242,356.94

Total cost to June 30, 1908, distributed to principal physical features

Coal mine.....	\$2,545.62
Main canal:	
Earthwork and structures.....	51,568.81
Constructing machinery.....	34,891.28
Wagon road.....	14,117.73
Real estate (rights and property).....	14,253.75
Buildings (offices, dormitories, warehouses, etc.).....	19,331.73
Telephone lines.....	1,614.01
Saw and planing mill.....	3,919.08
Examination of project as a whole.....	35,820.23
Administration of project as a whole.....	41,474.41

Total building cost as per debit in cost of work in statement
of assets and liabilities..... 219,536.70

SUN RIVER PROJECT**GENERAL STATEMENT**

The principal data relating to the Sun River project are summarized as follows:

Counties: Teton, Lewis and Clark, Chouteau, and Cascade.
 Townships: 20 to 25 N., Rs. 3 E. to 8 W., M. M.
 Irrigable area: 276,000 acres. Ownership, public, 180,000 acres; state and school, 22,000 acres; private, 74,000 acres.
 Average elevation of irrigable area: 3,700 feet above sea level.
 Average annual rainfall on irrigable area: 12 inches.
 Range of temperature on irrigable area: Maximum, 100°; minimum, -40°.
 Character of soil of irrigable area: Sandy loam, clay, adobe, and alluvium.
 Duty of water: 1½ acre-feet per acre per annum.
 Size of farm units: 40 to 160 acres.
 Principal products: Alfalfa, hay, grain, vegetables, and sugar beets.
 Railroad stations: Vaughn, Power, Dutton, and Collins, Mont.
 Railroad: Great Northern.
 Principal markets: Great Falls, Helena, and Butte, Mont.
 Watershed area: 850 square miles on Sun River; 290 square miles on Teton River.
 Estimated annual run-off of watershed: Maximum, 1,000,000 acre-feet; minimum, 400,000 acre-feet.

Reservoirs: Warm Springs, area, 1,976 acres; capacity, 156,860 acre-feet. Willow Creek, area, 2,285 acres; capacity, 84,320 acre-feet. Pishkun, area, 1,542 acres; capacity, 45,747 acre-feet. Benton Lake, area, 9,130 acres; capacity, 140,200 acre-feet.

Storage dams: Warm Springs, type, rock fill and hydraulic fill; height, 190 feet; length, 762 feet. Willow Creek, type, hydraulic fill; height, 110 feet; length, 1,045 feet. Benton Lake, type, earth fill; height, 35 feet; length, 120 feet.

Diversion dams: Type, reenforced concrete. Canyon, height, 72 feet; length, 150 feet. Deep Creek, height, 12 feet; length, 100 feet.

Main canals: Length, 155 miles.

Laterals: Length, Fort Shaw unit, 39½ miles; others not surveyed.

Distributing and waste ditches: Length, Fort Shaw unit, 44½ miles.

Tunnels: Length, north side system, 10,600 feet in 5 tunnels

Construction of project authorized: February 26, 1906.

Per cent of project completed: 5.9; Fort Shaw unit, 96.

A detailed description of the Sun River project will be found in the fourth annual report and of the Fort Shaw unit in the fifth annual report, and general descriptions relating to the project are given in the third and fifth annual reports. Briefly, the irrigation plan of this project contemplates the construction of a storage reservoir on the North Fork of Sun River controlled by the Warm Springs dam, storing the flow of this branch of Sun River, a diversion dam on the South Fork of Sun River diverting water into a supply canal discharging into the Warm Springs reservoir, a diversion dam on the Sun River about 12 miles below the Warm Springs reservoir diverting water into two canals, one on the north side of the river serving as a supply canal to the Pishkun reservoir, the other on the south side of the river serving as a supply canal for the Willow Creek reservoir, and the construction of the Pishkun and Willow Creek reservoirs with their subsidiary canal systems. The water supplied to the Pishkun reservoir will be taken out into a canal to be constructed so as to cover the highlands to the north of Sun River. A portion of the water of this same reservoir is to be discharged into Deep Creek, a tributary of Teton River on which a diversion dam is to be constructed diverting water into a canal and irrigating lands on the southern slope of the Teton River basin. The water stored in the Willow Creek reservoir is to be discharged into Sun River and diverted through concrete headworks without a diversion dam into a canal on the south side of Sun River, watering 16,000 acres in the vicinity of Fort Shaw, Mont. The diverting works under the Fort Shaw canal system are practically completed and some little work has been done on the Willow Creek storage reservoir.

WILLOW CREEK RESERVOIR

The placing of concrete lining in the outlet tunnel for the Willow Creek reservoir was practically completed early in October, 1907, and owing to the failure of the valve ordered for controlling the outlet to arrive in time for installation during the field season of 1907, work was shut down October 9, 1907, and the gate shaft left unlined but timbered pending such time as conditions warrant resumption of the work. To supply the needs of the Fort Shaw unit until the Willow Creek dam can be completed, additional water can be secured from Bowl Creek; also the amount of snow and rain in the mountains in the spring of 1908 have been such that it was not considered necessary to push work at present on the Willow Creek reservoir.

DIVERSION OF BOWL CREEK

In a reconnaissance made during September, 1907, it was found that by the construction of about $1\frac{1}{2}$ miles of canal, Bowl Creek, a small tributary of Flathead River lying on the west side of the continental divide, could be carried across and emptied into North Fork of Sun River. No accurate surveys have yet been made, nor have gagings been made of the stream, owing to its inaccessibility, but it is thought that sufficient water can be obtained to supplement the unregulated flow of Sun River for the irrigation of the Fort Shaw unit, and that because the drainage area of this creek lies between elevations 6,100 and 9,000 feet above sea level and on the west side of the divide in a well-timbered region the natural melting of the snows will be at such a season as to materially supplement the waters of Sun River. Surveys will be made to secure accurate data as soon as practicable.

FORT SHAW UNIT

Construction of the Fort Shaw unit of the Sun River project has been continued under contracts and by force account so that at the end of the fiscal year the construction of the principal part of the unit was nearly completed.

On June 6, following a rain, which the Fort Shaw gage showed to be 4 inches in eighteen hours, Sun River rose to a height about 2 feet higher than ever experienced in the forty-six years since the valley has been inhabited. Considering the fact that the canals and laterals were freshly built, had never been primed, had no vegetation upon their banks, and that many openings had been made for culverts, turnouts, and other structures, the damage done was very slight. Several breaks occurred in the old Crown Butte canal lying above the new work, which concentrated the flood upon given places; had it not been for this, the damage would have been 50 per cent less. The total damage is estimated at about \$4,500. It had been expected that force account work on all structures would have been practically completed during June, but the necessity of repairing the damage resulting from the flood will postpone the completion of structures until later in the season. The headworks, the drop and turnout at station 293, the Simms Creek siphon, the A turnout, the A drop and C drop, the important concrete structures, have been finished. The work remaining to be done includes the minor turnouts and culverts and small wooden bridges.

The construction of some of the located laterals and sublaterals has been postponed in places where it was thought that settlement would be slow, in order that an opportunity for cooperative work might be offered to the settlers and also to aid in concentrating settlement as much as practicable and in lessening the maintenance and operation expenses.

NORTH SIDE CANAL SYSTEM

A topographic party started work on the Greenfields bench on the north side during the spring of 1908, securing data to be used in the preparation of farm unit plats and in the designing of the distribution system, preparatory to construction that has been asked for by

he settlers to be carried on under cooperation. Owing to the greater need of the available funds for the completion of construction work on the Fort Shaw unit, it was necessary to abandon further work on these surveys for the balance of the season.

COOPERATIVE CONSTRUCTION

Considerable interest has been manifested by the settlers on the Greenfields bench in the prosecution of work in that vicinity. They are prepared to start construction through their water users' association at as early a date as may be allowed. There are about 200 claims filed on, most of which were taken with the expectation of securing water from the old Kilraven Cooperative Canal Company, which was abandoned shortly after the withdrawal of the lands in that region by the United States. Most of the claimants have secured extensions of time upon their desert entries and are expecting to make proof thereon with water furnished from the government canals, and having already had these lands four or five years they are very anxious to secure water for them so that they may carry on their farming operations. As the matter now stands, they have no water supply of any kind, and are not able to make a satisfactory living under dry farming methods and are very willing to cooperate to the fullest extent of their resources in the construction of canals. By adopting the policy of constructing comparatively small units of the project, one after another, and carrying on simultaneously the construction of the dams, reservoirs, and tunnels that can not very well be done under cooperation, it is expected that the settlers upon each unit of the project will at first do considerable cooperative work and later will be able to make their payments in cash. By following this system of construction it is anticipated that the project can be completed without making a large draft on the reclamation fund.

RIGHT OF WAY

The purchase of the 1,600 acres of flowage lands for the Willow Creek reservoir has not been completed, owing to the failure of the owner to perfect title.

WATER RIGHT ADJUDICATIONS

There has been no visible change of status in the adjudication suit over the waters of Sun River, although it is understood that some progress has been made and that the litigants expect to have the matter settled within a few months.

WATER USERS' ASSOCIATIONS

The Sun River Water Users' Association formulated their contract to be offered for the secretary's signature, but the association having neglected to accompany it with authorizations for its signature by the officers thereof the proposed contract has been returned to them for the additional data and will be forwarded at once upon their complying with the requirements.

The Sun-Teton Water Users' Association has been formed by the holders of private lands on the north side of Sun River. They have been experiencing some difficulty in filing their articles of incorporation with the Secretary of State of Montana, owing to a misunderstanding as to their articles fulfilling the requirements of the special act of the Montana legislature allowing water-users' associations under the reclamation act to file their articles of incorporation for a charge of \$10 instead of for a fee prorated upon the capitalization. It is thought that an understanding will be reached shortly, and that the association will complete its organization and be in shape to assist in beginning and prosecuting cooperative work on the north side.

TOWN SITES

The town sites of Fort Shaw and Simms have been surveyed and subdivided. Appraisers have been appointed to value the lots in 40 acres of each of these town sites so that they may be offered for sale on October 15, 1908, but no definite instructions have yet been issued as to the time of appraisal. The portions of the town sites that will be offered for sale do not include the sites of buildings erected for engineers' quarters.

On March 14, 1908, the following reservations were made under the first form for town-site purpose:

NW. $\frac{1}{4}$ sec. 12, T. 21 N., R. 4 W.
 SW. $\frac{1}{4}$ sec. 20, T. 22 N., R. 1 W.
 SE. $\frac{1}{4}$ sec. 20, T. 22 N., R. 2 W.
 SW. $\frac{1}{4}$ sec. 27, T. 22 N., R. 3 W.
 SE. $\frac{1}{4}$ sec. 10, T. 23 N., R. 4 W.
 E. $\frac{1}{4}$ SE. $\frac{1}{4}$, sec. 25, T. 24 N., R. 1 W.
 W. $\frac{1}{4}$ SW. $\frac{1}{4}$, sec. 30, T. 24 N., R. 1 E.
 NE. $\frac{1}{4}$, sec. 10, T. 24 N., R. 1 W.
 SE. $\frac{1}{4}$, sec. 3, T. 24 N., R. 2 W.
 SE. $\frac{1}{4}$ sec. 20, T. 24 N., 3 W.
 SE. $\frac{1}{4}$ sec. 34, T. 25 N., R. 3 W.
 NW. $\frac{1}{4}$ sec. 28, T. 25 N., R. 1 E.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Sun River project

No.	Contractors.	Features.	Estimated values.	Estimated earnings, June 30, 1908.	Completions due—.
155	Universal Portland Cement Co.	Cement.....	\$3,547.50	\$3,547.50	Dec. 31, 1907
165	Bailey & Dupes.....	Fort Shaw unit, division 5..	19,720.00	19,288.62	Aug. 15, 1908
170	Sequist, Clark & Johnson.....	Fort Shaw unit, division 3..	30,240.00	* 22,980.28	July 1, 1908
171	Chas. E. Crepeau.....	Fort Shaw unit, division 4....	25,810.00	* 24,810.90	June 1, 1908
173	Expanded Metal and Corrugated Bar Co.	Steel bars.....	3,038.96	* 3,038.96	Feb. 15, 1908
175	W. D. Lovell.....	Fort Shaw unit, division 1....	48,470.00	56,333.55	June 1, 1908
176	J. C. Furman.....	Fort Shaw unit, division 2....	24,700.00	25,689.02	Do.
213	Marquette Cement Manufacturing Co.	Cement.....	1,925.85	1,925.35	May 1, 1908

* Completed.

LANDS OPENED FOR IRRIGATION

On March 26, 1908, approved plats of 6 townships, designating about 14,796 acres of land irrigable under the Sun River project, were forwarded to the General Land Office with the following public notice:

PUBLIC NOTICE DATED MARCH 26, 1908

In pursuance of the provisions of section 4 of the reclamation act of June 17, 1902 (32 Stat. L., 388), notice is hereby given as follows:

The irrigation system for the Fort Shaw unit of the Sun River project, Montana, will be ready for service about June 1, 1908, and such water supply as may be practicable will be furnished therefrom during the coming season for the irrigable land shown upon farm-unit plats of T. 20 N., Rs. 1, 2, 3, and 4 W., and T. 21 N., Rs. 1 and 2 W., M. M., approved March 23, 1908, by the Secretary of the Interior, and on file in the local land offices at Great Falls and Helena, Mont.

Homestead entries, accompanied by applications for water rights and the first installment of the building and operation and maintenance charges, may be made on and after May 7, 1908, under the provisions of the said act for the farm units shown on said plats. Water-right applications for homestead entries heretofore made and for lands in private ownership must likewise be accompanied by the first installment of the water-right charges.

Warning is hereby expressly given that no person will be permitted to gain or exercise any right whatever under any settlement or occupation begun prior to May 7, 1908, on any lands now withdrawn under the first form, and all such settlement or occupation is hereby forbidden.

The limit of area per entry, representing the acreage which, in the opinion of the Secretary of the Interior, may be reasonably required for the support of a family on the lands entered subject to the provisions of the reclamation act, is fixed at the amounts shown upon the plats for the several farm units.

The limit of area for which water-right application may be made for lands in private ownership shall be 160 acres of irrigable land for each landowner.

The charges which shall be made per acre of irrigable land in the said entries and for lands in private ownership which can be irrigated by the waters from the said irrigation project are in two parts as follows:

1. The building of the irrigation system, \$30 per acre of irrigable land, payable in not less than 5 nor more than 10 annual installments, each not less than \$3 per acre.

2. For operation and maintenance, which will, as soon as the data are available, be fixed in proportion to the amount of water used, with a minimum charge per acre of irrigable land, whether water is used thereon or not. The operation and maintenance charges for the irrigation season of 1909 and until further notice will be 50 cents per acre of irrigable land, whether water is used thereon or not; and I hereby establish the regulation that no water will be furnished in any year until the operation and maintenance charges for the preceding years have been paid.

The first installment on account of the said charges for all irrigable lands shown on these plats, whether or not water-right application is made therefor or water is used thereon, shall be paid, for the season of 1909, at the local land offices at Great Falls, Mont., or Helena, Mont., at the time of filing water-right application, the total payment being not less than \$3.50 per acre. For lands in private ownership and for lands heretofore entered for which water-right application is not made prior to March 1, 1909, the first installment shall become due on that date.

Such water as can be furnished during the remainder of the season of 1908, after the completion of the works, will be included as part of the water supply for which payment is made for the season of 1909.

The portion of the installment for the building charge for the second year shall be due and payable March 1, 1910, at the same places, and for subsequent years on or before March 1 of each year thereafter, and until further notice the portion for operation and maintenance, 50 cents per acre of irrigable land per annum, shall be due and payable at the same time and place.

For all applications for water rights filed after June 15, in any year subsequent to 1908 the building and operation and maintenance charges for that irrigation season shall be collected at the time of filing, but the portion of the installment paid on account of operation and maintenance shall be a credit on account of the installment for the next year.

The charges herein provided for may, for the convenience of applicants, be paid to the special fiscal agent of the United States Reclamation Service at Fort Shaw, Mont., for transmission to the receivers of the local land offices at Great Falls and Helena, Mont., respectively, on or before the dates specified herein for payments at the local land offices.

INSTRUCTIONS ACCOMPANYING PUBLIC NOTICE

The above notice was accompanied by a request that the local land officers be instructed to publish the notice once a week for four weeks in the Great Falls Leader and to announce that water-right applications must be filed in proper form in the local land office before water can be furnished; that the United States will operate and maintain the storage and diversion dams and main headworks, and the main canal, as shown on a plat of the project approved by the director, copy of which is on file in the office of the engineer in charge of the project, the cost thereof to be included in the operation and maintenance charges; that no water will be furnished in any year until the portion of the installment for operation and maintenance for prior years has been paid; that the amount of water to be furnished is 2 acre-feet per acre per annum; that the building charge and number of annual installments are to be stated in the third paragraph of each application; and that the Secretary of the Interior has not entered into a contract with a water users' association and the certificate relative thereto forming part of the water-right application need not be filled in.

SETTLEMENT

Of the 14,796.08 acres of land opened by the public notice of March 26, 1908, 12,417.36 acres are public and 2,378.72 acres are private. The total number of farm units in the public area is 205, eight of which, covering 466 acres, have been entered. Water will be ready for use on all farms needing it for the irrigation season of 1909.

CHARACTER OF FARMS AND CROPS

Of the 205 farms on this unit, many contain a total area of 160 acres, each with an irrigable area varying from 25 to 115 acres. The average total acreage of the farms is 88 acres each and the average irrigable area 61 acres. The irrigable lands on the Fort Shaw unit have a great variety of soil for so small an area. There is in some parts a sandy loam with a subsoil of compact gravel, which is found to be excellent alfalfa land. In other portions of the unit the subsoil is clay and more suitable for other crops. On the lower lands nearer the river 42 of the farms have a natural growth of trees and the soil is better adapted to gardening, vegetables, and small fruits. In still other places along the slope of the Fort Shaw butte it is thought that because of the protection afforded by the butte, the northern exposure, and the character of the soil the raising of apples and hardy northern fruits will be made a specialty and that good success will probably attend efforts in this direction.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected miscellaneous.....	\$257.16		\$600.16
Uncollected water right building charges.....	294.00		
Uncollected water right operation and maintenance charges.....	49.00		
Inventories:			
Mercantile stores.....	54.36		29,406.85
Government animals.....	7,644.24		
Equipment in use.....	10,105.59		
Storehouse.....	3,991.36		
Cement.....	3,067.35		
Iron and steel.....	832.38		
Lumber.....	3,161.38		
Fuel.....	550.19		
Cost of work:			
Building cost.....	436,479.80		450,571.93
Plus adjustments.....	15,984.78		
Less accrued revenues.....		\$494.65	
Less accrued repayments.....		1,398.00	
	452,464.58	1,892.65	
Operation and maintenance cost.....	555.93		322.98
Less accrued repayments.....		233.00	
	555.93	233.00	
Total.....			480,901.87
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		2,343.04	56,771.85
Unpaid purchases.....		3,015.53	
Unpaid contract estimates.....		17,598.87	
Unpaid contract holdbacks.....		12,291.33	
Unpaid freight and express.....		9,483.93	
Unpaid passenger fares.....		27.40	
Unpaid land agreements.....		12,011.75	
Investment of the United States:			
Disbursement vouchers.....		415,455.18	424,130.02
Collection vouchers.....	2,783.20		
Transfer vouchers received.....		13,547.34	
Transfer vouchers issued.....	2,089.30		
	4,872.50	429,002.52	
Total.....			480,901.87

Total cost to June 30, 1908, distributed to principal physical features

Willow Creek reservoir:	
Willow Creek dam.....	\$515.41
Outlet tunnel.....	19,417.13
Fort Shaw distributing system:	
Earthwork and structures.....	178,151.47
Concrete pipe plant.....	8,113.32
Supply canal.....	109,454.57
Experimental farm.....	154.17
Hydrography.....	4,163.97
Real estate (rights and property).....	14,257.69
Buildings (offices, dormitories, warehouses, etc.).....	16,694.61
Telephone system.....	5,825.21
Irrigable lands (farm units, subdivision).....	1,224.14
North side surveys.....	70,265.13
Musselshell reconnaissance.....	3,313.64
Administration of project as a whole.....	2,238.11
Cost ledger inventories.....	2,691.23

Total building cost as per debit in cost of work in statement
of assets and liabilities..... 436,479.80

MONTANA-NORTH DAKOTA

LOWER YELLOWSTONE PROJECT

GENERAL STATEMENT

The principal data relating to the Lower Yellowstone project are summarized as follows:

Counties: Dawson, Mont., and McKenzie, N. Dak.
Townships: 18 to 28 N., Rs. 56 to 60 E. M. M.; 150 to 152 N., R. 104 W., fifth principal meridian.
Irrigable area: 66,520 acres. Ownership, public, 19,550 acres; State and school, 2,150 acres; railroad, 5,584 acres; private, 39,236 acres.
Average elevation of irrigable area: 1,865 to 1,980 feet above sea level.
Average annual rainfall on irrigable area: 16 to 20 inches.
Range of temperature on irrigable area: Maximum, 107°; minimum, -49°.
Character of soil of irrigable area: Deep sandy loam.
Duty of water: 1 second-foot per 100 acres.
Size of farm units: 40 to 160 acres.
Principal products: Forage crops.
Railroad stations: Glendive and Mondak, Mont.
Railroads: Great Northern and Northern Pacific.
Principal markets: Minneapolis and St. Paul, Minn., and local points.
Watershed area: 66,000 square miles.
Diversion dam: Type, rock-fill crib weir; height, 12 feet; length, 700 feet.
Main canals: Length, 67 miles.
Laterals: Length, 207 miles.
Power development: 290 horsepower.
Construction of project authorized: May 10, 1904.
Per cent of project completed: 77.5.

A detailed description of the Lower Yellowstone project will be found in the sixth annual report, and general descriptions relating to the project are given in the third, fourth, and fifth annual reports. Briefly, the irrigation plan of this project contemplates the construction of a diversion dam on the Yellowstone River at a point about 14 miles below Glendive, Mont., diverting water into a canal on the left side of the river extending to the Missouri River at the mouth of the Yellowstone River and covering lands lying between the canal and the Yellowstone River. A portion of the water entering the main canal will be utilized for operating direct-connected turbines and centrifugal pumps in a station located about 20 miles below the diversion dam. The construction of the diversion dam and the main canal are nearing completion.

LOWER YELLOWSTONE DAM

The contractor for the construction of Lower Yellowstone dam made slow progress during the latter part of the year 1907 and early in 1908, but work on the dam was resumed in earnest in April, 1908,

and excellent progress was made until the rise in the river late in May in driving the round piles required for the foundation of the dam. At the close of June the contractor had a small force at work assembling the plant and rafting lumber, and was preparing to actively prosecute the whole work as soon as the high water recedes. On June 30, 1908, the contract was about 56 per cent completed.

EARTH DAM AT NELSONS SLOUGH

To protect the bank of the main canal at Nelsons Slough, about 1 mile south of Burns Creek, it was found desirable to construct an earth dam across the slough and to repair the bank of the canal. Proposals for this work were received on September 23, 1907, and a contract was awarded therefor. The work was done in a satisfactory manner, the date of completion being December 24, 1907.

EXCAVATION OF MAIN CANAL AND LATERALS

The contractors for the excavation of division 1 of the main canal had completed 84.6 per cent of the work on June 30, 1908. The work has been poorly handled from the start.

The excavation of division 2 of the main canal was practically completed in March, 1908, but owing to a small amount of work that could not be done until the frost was out of the ground, the contract was not officially closed until May 15, 1908, the date required by the contract for completion.

Excellent progress is being made by the contractors for the excavation of division 3, main canal, 92.7 per cent of this work having been finished at the end of the fiscal year.

The contractor for the excavation of division 4 of the main canal has been making very unsatisfactory progress, and at the end of June, 1908, had completed only 84.5 per cent of the work. On June 30, 87.3 per cent of the excavation of divisions 5, 6, 7, and 9, main canal, and laterals A to M, except F, had been completed. Owing to the probability that it will be a few years before the laterals under division 9 of the main canal will be required, it was thought unnecessary to construct that division at this time, and a supplemental contract was entered into eliminating the excavation thereof from the original contract.

Good progress has recently been made on the excavation of division 8 of the main canal and laterals F, O, and P, and the contract will probably be completed in July, 1908. On June 30 the work was 84.4 per cent completed.

The excavation of lateral N was satisfactorily completed September 25, 1907.

The contractors for the excavation of laterals and waste ditches, headworks to Newlon, schedule 1, made very good progress and the work was satisfactorily completed on December 24, 1907.

The work of excavating laterals and waste ditches, headworks to Newlon, schedules 2 and 3, was shut down last fall, with the work 98.4 per cent completed, and had not been resumed on June 30, 1908. The contract time expires September 1, 1908.

The work of constructing culvert drains in divisions 5 and 6, main canal, was brought to a satisfactory close on September 25, 1907.

STRUCTURES OF MAIN CANAL AND LATERALS

On June 30, 1908, 90.7 per cent of the work of building structures on divisions 1, 2, and 3 of the main canal was completed. A supplemental contract was entered into January 10, 1908, eliminating the Linden Creek flume and Nelsons Slough sluiceway from this contract.

The contractors for the structures on division 4, main canal, brought the work to a satisfactory close on December 7, 1907.

Since it was decided not to extend the main canal over division 9, a supplemental contract was entered into on February 22, 1908, with the contractor for structures on divisions 5 to 9, main canal, and laterals A to P, eliminating the structures on divisions 8 and 9 from the contract. The canal can be extended over this territory and the structures thereon erected while laterals are being extended for the last division. On June 30, 1908, 70 per cent of the work remaining under the contract had been completed.

The contract for earthwork, division 1, main canal, has delayed the work of the contractor for structures, headworks to Newlon, by failing to excavate the canal at the sites of structures within the time required. On June 30, 1908, the contract for structures was 64.5 per cent completed.

On May 15, 1908, a contract was entered into for the construction of the Linden Creek flume and sluiceway. Practically nothing had been accomplished on June 30, 1908.

On April 25, 1908, a contract was entered into for the construction of bridge abutments, and on June 30, 1908, 14.8 per cent of the work had been completed.

Contract was made on May 6, 1908, covering the construction of lateral turn-outs, but practically nothing had been accomplished on June 30, 1908.

On March 19, 1908, a contract was entered into for furnishing 21 sluice gates similar to those already purchased, and on April 9, 1908, two more gates were ordered. All of this material was delivered in May, 1908.

Lumber was ordered for the timber structures to be built from the headworks to Newlon during the winter and hauled to La Mesa, where a sawmill was erected and the lumber sawed. The construction of these structures is being done by force account, and at the end of June this work was about 40 per cent completed.

HIGHWAY BRIDGES

On June 30, 1908, the three bridges for the main canal contracted for in 1907 were erected and contract completed with the exception of painting.

On November 15, 1907, proposals were received for the construction and erection of 34 steel highway bridges, and in February, 1908, contracts were entered into for this work. At the close of the fiscal year the materials for these bridges were being delivered.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Lower Yellowstone project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
48	Chas. Stabern	Main canal, divisions 1, 2, and 3, structures.	\$104,276.35	\$93,797.07	May 1, 1908
49	Deadwood Construction Co.	Main canal, division 4, structures.	28,142.50	37,295.81	July 31, 1907
78	John A. Nelson	Main canal, divisions 5, 6, 7, and 9, and laterals A to M, earthwork.	252,770.00	211,978.76	Sept. 2, 1908
82	Nohle and Mann	Lateral N, earthwork.	5,727.50	6,556.78	July 1, 1907
99	Henry C. De Laney	Main canal, division 4, earthwork.	88,091.00	87,188.23	June 1, 1908
102	Illinois Steel Co.	Cement.	20,000.00	13,408.00	.....
106	D. H. Freeman & Co.	Main canal, division 2, earthwork.	251,516.00	311,583.80	May 15, 1908
109	John A. Nelson	Main canal, division 8, and laterals O and P, earthwork.	29,983.00	24,213.83	June 24, 1908
110	D. H. Freeman & Co.	Main canal, division 1, earthwork.	205,115.00	193,969.17	May 15, 1908
115	Newman & Hoy	Main canal, division 3, earthwork.	245,038.00	243,595.11	June 15, 1908
116	James Munn	Main canal, divisions 5 to 9, and laterals A to P, structures.	205,814.50	135,522.00	Dec. 1, 1908
133	Pacific Coast Construction Co.	Lower Yellowstone dam	142,825.00	80,783.53	Feb. 1, 1909
157	Arthur J. Coates & Co.	Laterals and waste ditches	112,011.00	107,913.96	Sept. 1, 1908
161	Pittsburgh Manufacturing Co.	Sluice gates	2,698.50	2,698.50	.....
162	.....do.....	Sluice gates for turnouts	4,895.60	6,061.47	June 8, 1908
167	D. H. Freeman & Co.	Laterals and waste ditches	25,205.50	25,600.12	Jan. 1, 1908
173	Expanded Metal and Corrugated Bar Co.	Steel bars	1,083.02	1,083.02	Feb. 15, 1908
196	A. Y. Bayne & Co.	Highway bridges	7,026.70	6,811.70	June 1, 1908
198	John A. Nelson	Culvert drains	5,905.50	5,745.02	Oct. 28, 1907
206	James Munn	Structures, headworks to Newlon.	64,937.50	21,877.46	Sept. 30, 1908
211	Burton & Hayes	Nelsons Slough dam	3,495.00	3,809.05	Dec. 31, 1907
213	Marquette Cement Manufacturing Co.	Cement	2,003.76	2,003.76	May 1, 1908
218	Minneapolis Steel and Machinery Co.	Highway bridges	17,885.00	.....	Nov. 1, 1908
219	A. Y. Bayne & Co. ....	.....do.....	17,389.00	8,694.50	Do.
224	Universal Portland Cement Co.	Cement	4,750.00	475.00	Oct. 1, 1908
233	John S. Penson	Bridge abutments	10,877.75	1,609.10	Do.
235	.....do.....	Lateral turnouts	7,687.80	.....	Do.
243	James Burton	Linden Creek flume and sluiceway.	11,052.00	.....	Do.

• Completed.

AGRICULTURAL METHODS AND CROPS NOW GROWN

The Lower Yellowstone project is surrounded by one of the largest and best grazing regions in the United States. It is thus well located for the new settler who will wish to grow forage crops, for which there is a ready local demand at good prices, while he is preparing his land and installing equipment for more extensive farming. The local conditions of soil, climate, and transportation are favorable for the growth of alfalfa, and at least two heavy crops may be cut each season. Wheat, oats, barley, and flax do well, as do most of the ordinary garden vegetables that are grown in other States of the same latitude. Sugar beets, which have been so successfully grown in the upper end of the valley, will prove to be a valuable crop under irrigation, and the establishment of sugar mills in this vicinity will, without doubt, make the cultivation of these beets very profitable to the farmers.

During the season of 1907, 50 bushels of oats to the acre was the rule rather than the exception, while the yields of wheat, barley, flax, and all grains were exceptionally large. When one considers the results now obtained from dry farming in this semiarid region, due to the wonderful fertility of the soils, it is hard to tell what can be done under systematic irrigation, but there is no doubt that the use of water will make this portion of the lower Yellowstone Valley one of the very richest sections of farming land in the United States.

The Reclamation Service proposes to establish experimental farms on the project, which will be a source of valuable information for the people. These farms will, of course, be open to inspection by the water users, and the results obtained will be beneficial in many ways. All kinds of crops will be grown, and scientific methods of farming will be carried on with especial regard to irrigation.

TRANSPORTATION

The Lower Yellowstone project has an outlet to a transcontinental railroad at each end, the Great Northern on the north and Northern Pacific on the south. In addition to these, a railway line has been located through the entire length of the project by the Northern Pacific road. The new line of the Chicago, Milwaukee and St. Paul Railway has just been completed, and is located a few miles south of Glendive, crossing the main line of the Northern Pacific at Terry, 30 miles west of Glendive. This line will afford another connection to the east, as well as to the Pacific coast and intermountain points.

SETTLEMENT

The settlers on the project have made excellent progress in the last year in the development of their homesteads, and prosperous towns have sprung up throughout the length of the valley. Glendive and Mondak have grown materially since the establishment of the project.

The demand for land is increasing, and new settlers are arriving daily, thus increasing the price of land in private ownership, and further advances are likely. There seems little doubt that the 1,626 acres of vacant public land remaining open to settlement will be taken up as homestead entries in the very near future.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected freight refunds	\$1,428.15	}	\$1,487.75
Uncollected miscellaneous	58.60		
Inventories:			
Government animals	5,500.00	}	111,051.84
Equipment in use	10,685.77		
Storehouse	1,634.85		
Cement	53,211.00		
Iron and steel	29,029.61		
Lumber	5,745.21		
Forage	144.40		

Assets and liabilities on June 30, 1908—Continued

Items.	Debits.	Credits.	Amounts.
ASSETS—continued.			
Cost of work:			
Building cost.....	\$2,017,503.13		
Plus adjustments.....	16,869.37		
Less accrued revenues.....		\$5,318.84	
	2,034,372.50	5,318.84	\$2,029,053.66
Total.....			2,141,593.25
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		8.25	
Unpaid purchases.....		1,864.78	
Unpaid contract estimates.....		98,708.96	
Unpaid contract holdbacks.....		131,161.53	
Unpaid freight and express.....		6,415.49	
Unpaid passenger fares.....		26.90	
Unpaid land agreements.....		11,647.81	
			249,833.72
Investment of the United States:			
Disbursement vouchers.....		1,870,611.13	
Collection vouchers.....	10,128.27		
Transfer vouchers received.....		36,829.02	
Transfer vouchers issued.....	5,552.35		
	15,680.62	1,907,440.15	1,891,759.53
Total.....			2,141,593.25

Total cost to June 30, 1908, distributed to principal physical features

Lower Yellowstone diversion dam:	
Earth and concrete work.....	\$84,509.31
Main canal:	
Earthwork—	
Division 1.....	242,851.73
Division 2.....	328,693.46
Division 3.....	244,048.89
Division 4.....	98,199.14
Divisions 5 to 9 and laterals.....	264,762.16
Structures—	
Divisions 1 to 4.....	182,859.12
Divisions 5 to 9 and laterals.....	154,832.17
Distributing system:	
Earthwork.....	153,392.25
Structures.....	8,143.83
Highway bridges.....	23,834.98
Repairs to Burns Creek dam.....	2,533.63
Real estate (rights and property).....	24,969.23
Buildings:	
Offices, dormitories, warehouses, etc.....	16,570.73
Maintenance of camps.....	4,508.27
Telephone system.....	21,230.55
Irrigable lands:	
Farm unit subdivision and soil examination.....	2,116.02
Land surveys.....	11,332.09
Examination of project as a whole.....	48,337.53
Administration of project as a whole.....	98,621.12
Cost ledger inventories.....	1,156.92
Total building cost as per debit in cost of work in statement of assets and liabilities.....	2,017,503.13

NEBRASKA-WYOMING

NORTH PLATTE PROJECT

GENERAL STATEMENT

The principal data relating to the North Platte project are summarized as follows:

Counties: Sioux, Scotts Bluff, Banner, and Cheyenne, Nebr.; Natrona, Carbon, Converse, and Laramie, Wyo.

Townships: 20 to 27 N., Rs. 50 to 66 W., sixth principal meridian.

Irrigable area: 97,000 acres, Whalen north side diversion. Ownership, 75 per cent public, remainder private.

Average elevation of irrigable area: 4,100 feet above sea level.

Average annual rainfall on irrigable area: 15 inches.

Range of temperature on irrigable area: Maximum, 100°; minimum, -25°.

Character of soil on irrigable area: Sandy loam.

Duty of water: 2½ acre-feet per acre per annum.

Size of farm units: Whalen north side diversion, 80 acres.

Principal products: Alfalfa, cereals, sugar beets, and potatoes.

Railroad stations: Scotts Bluff, Mitchell, and Morrill, Nebr.; Torrington, Wyo.

Railroad: Chicago, Burlington and Quincy.

Principal markets: Omaha, Nebr.; Kansas City and St. Joseph, Mo.; Denver, Colo.; Missouri River and Central Wyoming points.

Watershed area: 12,000 square miles.

Average annual rainfall on watershed: 18 to 25 inches.

Estimated annual run-off of watershed: 1,500,000 acre-feet at Pathfinder dam.

Reservoir: Area, 21,774 acres; capacity, 1,025,000 acre-feet.

Storage dam: Type, concrete rubble masonry arch; height, 215 feet; length, 500 feet on top.

Diversion dam: Whalen, type, reenforced concrete weir; height, 25 feet; length, 325 feet. Guernsey, not designed.

Main canals: Whalen north side diversion, length, 95 miles.

Laterals: Whalen north side diversion, length, 350 miles.

Tunnel: 480 feet.

Dikes: Pathfinder, length, 1,600 feet; height, 38 feet. Whalen diversion, length, 2,000 feet.

Construction of project authorized: May 3, 1903.

Per cent of project completed: Whalen north side diversion, 93.

A detailed description of the North Platte project will be found in the fourth annual report, and general descriptions relating to the project are given in the second, third, fifth, and sixth annual reports.

Briefly, the irrigation plan of this project involves the construction of a storage reservoir controlled by the Pathfinder dam on the North Platte River at a point about 50 miles southwest of Casper, Wyo.; a diversion dam on the North Platte River at Guernsey, Wyo., for diverting water into a canal on the right side of the river covering lands in the Goshen Hole in eastern Wyoming and western Nebraska; and a diversion dam near Whalen, Wyo., diverting water into the interstate canal on the left side of the river and into the Fort Laramie canal on the right side of the river covering lands in the North Platte Valley. The Pathfinder dam, the diversion dam at Whalen, and the interstate canal system are under construction.

PATHFINDER DAM

The sixth annual report contains a brief account of the foundation for the Pathfinder dam and of the masonry construction to elevation 5,690 feet above sea level, approximately 40 feet above the average elevation of the foundation. In constructing the dam a notch having a bottom width of 6 feet was left at the southerly end thereof to carry the seepage from the upper temporary dam and to act as a waste way for the spring floods of 1907, so that masonry work might be carried on as long as possible during the flood season. When this notch had become 36 feet deep and 75 feet wide at the top, it was decided to abandon masonry construction until such time as the notch could be closed, the working area having become too small to carry on the work to advantage. Early in August, 1907, the river had lowered sufficiently to permit the repairing of the temporary dam. The bulk of the water was diverted through the tunnel and the seepage through the temporary dam was pumped into a flume discharging into one of the 36-inch pipes passing through the dam. The laying of masonry was resumed in the notch on August 16, and that portion of the dam was brought up to the average elevation of the other part by the close of September.

Masonry work on the dam was suspended toward the close of November, 1907, on account of cold weather, the top of the dam being then at elevation 5,721 feet above sea level. Work was resumed on February 25, 1908, and excellent progress has been made during the year. On June 30, 1908, the dam was completed to an average elevation of 5,765 feet above sea level, or about 119 feet above the foundation; the amount of masonry laid was 38,500 cubic yards, of which 28,300 cubic yards were laid during the fiscal year. The capacity of the contractor's plant is about 200 cubic yards of masonry per day, but the average daily output is about 125 cubic yards, the limited working area and the necessity of frequently moving the derricks accounting for the low average.

It being necessary to close the entrance to the diversion tunnel while the high-pressure gates were being installed, an opening 4 by 4 feet with semicircular top was left in the dam as a protection to the contractors, the invert of this opening being at an elevation of 5,691 feet above sea level. Without the use of this opening for carrying the flow of the river, the unusually high water during the fall of 1907 would have flooded the dam and caused a suspension of masonry operations for perhaps two months; also during the spring of 1908 the dam would have been flooded.

During the recent flood season, the surface of the water above the dam was for several days at an elevation 100 feet or more above the foundation of the dam, but though a careful examination was made no trace of moisture due to seepage could be detected on the downstream face. The maximum quantity of water in the reservoir at any one time was 30,000 acre-feet.

Three quarries are now in operation. The spillway quarry furnishes the most material, as all the crusher rock and the bulk of the backing stones are taken from it. A quarry for face stones was opened near the contractors' camp about a year ago and continues to furnish a good quality of stone. The third quarry furnishes backing stones only. The backing stones are irregular in shape and have uneven beds and require a large amount of cement, thus making the

work expensive. A free use of spawls and small stones has reduced the amount of cement used per cubic yard of masonry to nine-tenths of a barrel, while a cubic yard of concrete in the proportions used requires $1\frac{1}{2}$ barrels of cement. The south canyon wall lies in a plane radial to the face of the dam and furnishes an excellent skew back, but before reaching the solid rock a large quantity of excavation was necessary. The north canyon wall is very seamy and lies at quite an angle with a radial plane so that it is not only necessary to remove the seamy and unsound rock but to cut skew backs as well. The large amount of excavation on these walls has considerably increased the quantity of masonry required, and on this account the contractors have been granted an extension of time to August 1, 1909.

HIGH-PRESSURE GATES

Preparatory to installing the gates in the Pathfinder tunnel, considerable excavation and concrete work was necessary, all of which was done by force account. Operations were commenced early in July, 1907. The river being high, it was not possible at that time to close the entrance to the tunnel, so the upper 125 feet of the gate chamber shaft was concreted first. A timber bulkhead was placed at the tunnel entrance on September 27 and excavation of the gate chamber and approaches was commenced. The contractors for furnishing and installing the gates began work early in September, 1907, and made excellent progress, completing the work in April, 1908. After the castings were in position, the accessory concrete was placed by force account, this work being completed during the latter part of May. There were required 525 cubic yards of rock excavation and 950 cubic yards of concrete, much of it heavily reenforced. The gates have been operated against a small head and have been found to work very satisfactorily.

DIVERSION DAM AND HEADWORKS

The construction of the diversion dam and headworks for the Interstate and Fort Laramie canals was started early in the spring of 1907, and has progressed slowly throughout the fiscal year. On June 30, 1908, the construction of the dike at the right extremity of the dam was 64.5 per cent completed and the concrete work in connection with the weir and canal headworks was somewhat over one-half done.

INTERSTATE CANAL AND DISTRIBUTING SYSTEM

In June, 1907, four contracts were let for earthwork on the second lateral district under the interstate canal, and this part of the work was completed in December of that year. In July, 1907, a contract was awarded for the construction of ten 54-foot steel-truss highway bridges on the second division of the interstate canal and 55 wooden-stringer highway bridges in the first lateral district. These bridges were completed in March, 1908. In August, 1907, a contract was entered into for the construction of canal structures on the second division of the interstate canal and this work was completed in May, 1908. The canal structures in the first lateral district were constructed by force account, and were completed in the spring of 1908. Work on the structures in the second lateral district was begun by force account in June, 1908, and will be completed before the opening of the irrigation season of 1909.

In addition to the structures built by contract on the main canal, there have been constructed by force account during the fiscal year a number of important reenforced concrete structures, including box culverts, check gates, spillways and lateral headworks, as well as a number of structures of minor importance.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, North Platte project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due.
63	Geddis and Searle Stone Co.	Pathfinder dam	\$482,000.00	\$419,218.77	Aug. 1, 1909
74	W. O. Morrison.....	Interstate canal, division 1, structures.	130,876.90	\$165,652.66	July 1, 1907
77	Portland Cement Co....	Cement.....	14,000.00	\$13,998.60	.....
83	Deadwood Construction Co.	Interstate canal, division 2, sections 1, 5, and 8, earthwork.	309,351.00	\$368,371.37	June 1, 1907
113	Illinois Steel Co.....	Cement.....	21,077.00	21,077.00	Apr. 1, 1907
116	Hobbs, McElroy & McElroy.	First lateral distributing system, section 6, earthwork.	9,407.00	\$8,265.69	July 1, 1907
127	D. R. Noe.....	First lateral distributing system, section 9, earthwork.	6,922.50	\$5,628.85	Aug. 1, 1907
128	Frank Wynegar.....	First lateral distributing system, section 12, earthwork.	3,300.00	3,067.66	July 1, 1907
129	Deadwood Construction Co.	First lateral distributing system, section 2, earthwork.	8,175.00	\$4,815.22	July 10, 1908
137	Marcus E. Getter.....	First lateral distributing system, sections 10 and 11, earthwork.	5,649.00	\$5,642.13	July 1, 1907
138	Deadwood Construction Co.	First lateral distributing system, section 5, earthwork.	12,615.00	\$8,934.63	June 1, 1907
150	New Jersey Foundry and Machine Co.	High-pressure gates.....	68,000.00	67,940.39	Apr. 1, 1908
151	S. R. H. Robinson & Sons Co.	Diversion dam and headworks....	217,850.00	137,450.51	Apr. 11, 1908
152	Vulcan Iron Works.....	Gates and guides.....	4,051.37	\$4,161.37	June 1, 1907
155	Universal Portland Cement Co.	Cement.....	33,684.00	33,684.00	Dec. 31, 1907
164	Portland Cement Co....	do.....	19,133.61	19,133.61	June 30, 1908
174	Minneapolis Steel and Machinery Co.	Steel and cast iron.....	4,880.88	\$5,381.15	June 1, 1907
177	Wassom & Patterson...	Lateral 12, earthwork	1,455.00	\$1,217.01	Sept. 1, 1908
187	Detrick, Hoth and Rush.	Second lateral distributing system, earthwork, schedule 2.	16,793.50	\$14,621.49	Jan. 1, 1908
188	Marcus E. Getter.....	Second lateral distributing system, earthwork, schedules 4 and 5.	37,626.00	\$35,875.98	Apr. 30, 1908
189	Burke Construction Co.	Second lateral distributing system, earthwork, schedule 1.	30,159.00	\$17,329.50	Jan. 1, 1908
191	James O'Connor.	Second lateral distributing system, earthwork, schedule 3.	37,309.20	29,998.09	Do.
197	Expanded Metal and Corrugated Bar Co.	Steel.....	6,475.80	\$5,313.51	Dec. 31, 1907
200	Colorado Gray Iron Foundry Co.	Gates, etc.....	9,069.00	\$13,260.88	Do.
201	Canton Bridge Co.....	Interstate canal, division 2, steel truss highway bridges.	28,027.00	\$27,329.84	Mar. 30, 1908
202	Byal & Co.....	Interstate canal, division 2, structures, schedules 1 and 2.	90,853.00	79,796.51	June 1, 1908
213	Marquette Cement Manufacturing Co.	Cement.....	8,697.06	4,836.89	May 1, 1908
216	Fairbanks, Morse & Co.	Gasoline engine	637.00	.....	Feb. 3, 1908
220	Marquette Cement Manufacturing Co.	Cement.....	5,700.00	324.47	.....
224	Universal Portland Cement Co.	do.....	4,750.00	874.00	Oct. 1, 1908
226	Northern Electrical Manufacturing Co.	Generators and switchboards.....	400.00	.....	Apr. 26, 1908
240	Colorado Gray Iron Foundry Co.	Gates.....	3,498.00	\$3,560.44	July 15, 1908

α Completed.

LANDS OPENED FOR IRRIGATION

On July 29, 1907, approved plats of seven townships, designating about 37,394 acres of land irrigable under the North Platte project, were forwarded to the Commissioner of the General Land Office with the following public notice:

PUBLIC NOTICE DATED JULY 29, 1907

In pursuance of the provisions of section 4 of the reclamation act of June 17, 1902 (32 Stat. L., 388), notice is hereby given that water will be furnished from the North Platte project in Nebraska and Wyoming under the provisions of the reclamation act at the opening of the irrigation season of 1908 for the irrigable lands shown upon farm unit plats of Tps. 23 and 24 N., R. 56 W., Nebraska; Tps. 23, 24, and 25 N., R. 57 W., Nebraska; Tps. 23, 24, and 25 N., R. 58 W., Nebraska; fractional section T. 25 N., R. 57 W., Nebraska (shown on plat of T. 25 N., R. 58 W.); Tps. 24 and 25 N., R. 60 W., Wyoming, approved by the Secretary of the Interior and on file for the lands in the State of Nebraska in the local land office at Alliance, Nebr., and for the lands in the State State of Wyoming at the local land office in Cheyenne, Wyo.

The limit of area per entry representing the acreage which in the opinion of the Secretary of the Interior may be reasonably required for the support of a family on the lands in question is fixed for the land entered subject to the provisions of the reclamation act at the amounts shown upon the plats for the several farm units.

The limit for which water-right application may be made for lands in private ownership shall be 160 acres of irrigable land for each landowner.

The charges which shall be paid per acre of irrigable land upon said entries and upon lands in private ownership which can be irrigated by the waters of the said irrigation project are in two parts, as follows:

1. The building of the irrigation system, \$35 per acre of irrigable land, payable in not less than five nor more than ten annual installments, each not less than \$3.50 per acre.

2. For operation and maintenance, which will, as soon as the data is available, be fixed in proportion to the amount of water used with the minimum charge per irrigable acre, whether water is used thereon or not. The operation and maintenance charges for the irrigation season of 1908 and until further notice will be 40 cents per acre of irrigable land.

The first installment of said charges for all irrigable areas shown on these plats, whether or not water-right application is made therefor or water is used thereon, shall be due and payable on or before December 1, 1908, at the proper local land office, the total payment for 1908 being not less than \$3.90 per acre.

The building charge for subsequent years shall be due and payable at the same place on or before December 1, and until further notice the operation and maintenance charge will be 40 cents per acre of irrigable land per annum, due and payable at the same time and place.

INSTRUCTIONS ACCOMPANYING PUBLIC NOTICE

This notice was accompanied by request that the local land office be instructed to give publicity to said notice, and to announce that water-right applications must be filed in the proper form in the local land office before water can be furnished; that the United States will operate and maintain storage and diversion dams and main head-works, the main canals, and main laterals, as shown on a plat of the project approved by the Director of the Reclamation Service, copy of which is on file in the office of the engineer in charge of the project, the cost thereof being included in the operation and maintenance charges for the project; that the sublaterals constituting the rest of the distributing system are to be maintained by the water

users to be served therefrom at their own expense under regulations to be approved by the Secretary of the Interior; that the amount of water to be furnished is $2\frac{1}{2}$ acre-feet per acre per annum; that the building charge and number of annual installments are to be stated in the third paragraph of each application; and that the Secretary of the Interior has entered into a contract with the North Platte Valley Water Users' Association, and therefore the certificate of the association forming a part thereof must be filled in.

ORDER DATED MAY 29, 1908

On May 29, 1908, the following regulation was issued by the department in regard to time of payment of the portion of the annual installment covering charges due for operation and maintenance:

In pursuance of the public notice issued July 29, 1907, for the North Platte project, Nebraska-Wyoming, under the provisions of the reclamation act of June 17, 1902 (32 Stat. L., 388), and by virtue of the authority contained in section 10 of said act for the establishment of rules and regulations necessary and proper for the purpose of carrying the provisions of the act into full force and effect, the following regulation is hereby promulgated for the said project, namely, that the part of the annual installment covering charges due for operation and maintenance of all the irrigable land included in any water-right application must be paid on or before April 1 of each year, and in default of such payment, except as hereinafter provided, no water will be furnished for the irrigation of such lands. The receivers of public moneys at the proper local land offices are hereby authorized and directed to receive such portion of the reclamation water-right charges separate and apart from the building charges.

In case the operation and maintenance charges due in connection with any water-right application heretofore made remain unpaid sixty days from the date of notice hereof by the engineer of the United States Reclamation Service to the water-right applicant, the water shall be immediately turned off.

ORDER DATED JUNE 16, 1908

The regulation of May 29, 1908, concerning the collection of charges for operation and maintenance under the North Platte project, Nebraska-Wyoming, under the provisions of the reclamation act of June 17, 1902 (32 Stat. L., 388), is hereby modified, amending the last paragraph thereof so that it shall read as follows:

"In case the operation and maintenance charges due in connection with any water-right application heretofore made remain unpaid at the time when water is ready for delivery to the land of any water user, the water supply for such tract shall be immediately turned off."

SETTLEMENT

Practically all of the public land under the canals of the North Platte project has been filed on in tracts of 160 acres. As each entryman, however, will be obliged to conform his filing to an established farm unit, many relinquishments will be necessary, thus presenting opportunities for new settlers. Private land may also be purchased. Of the 37,394.10 acres of land opened by the public notice of July 29, 1907, 29,328 acres, divided into 393 farm units, are public land and 8,066.10 acres are private. Of the public lands 28 farm units, containing 2,165.53 acres, are covered by applications for water rights and one application covering 155 acres of private land has been filed.

OPERATION

During the irrigation season of 1908 water is being delivered from the first division of the interstate canal to about 6,500 acres of the 23,000 acres of irrigable land embraced in the Carey act segregation operated by the North Platte Canal and Colonization Company and from the second division of the interstate canal to about 16,000 acres of the 38,000 acres of irrigable land included in the first lateral district. No water is being furnished to lands in the second lateral district during the present season, but, nevertheless, about 9,000 acres therein are in cultivation without irrigation, with a promise of fair crops, and about 2,000 acres more are broken. Of all of the land in cultivation on the project this season about 36 per cent of the acreage is planted to oats, 22 per cent to corn, 18 per cent to wheat, and 24 per cent to other crops.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected freight refunds.....	\$192.44		
Uncollected miscellaneous.....	451.14		
Unadjusted water users' association work.....		\$3,635.21	
	643.58	3,635.21	Cr. \$2,991.63
Inventories:			
Government animals.....	14,241.11		
Equipment in use.....	21,138.46		
Storehouse.....	10,818.01		
Cement.....	55,255.66		
Iron and steel.....	1,274.71		
Lumber.....	1,245.77		
Forage.....	2,357.36		
Fuel.....	165.04		
Cost of work:			
Building cost.....	3,382,034.73		
Plus adjustments.....	14,688.80		
Less accrued revenues.....		7,554.07	
	3,396,723.53	7,554.07	3,389,169.46
Total.....			3,492,673.95
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		12,266.89	
Unpaid purchases.....		7,453.21	
Unpaid contract estimates.....		32,525.75	
Unpaid contract holdbacks.....		62,355.05	
Unpaid freight and express.....		49,352.59	
Unpaid passenger fares.....		529.08	
Unpaid miscellaneous.....		49.85	
Investment of the United States:			
Disbursement vouchers.....		2,820,833.66	
Collection vouchers.....	14,444.17		
Transfer vouchers received.....	8,045.45	529,797.49	
Transfer vouchers issued.....			
	22,489.62	3,350,631.15	3,328,141.53
Total.....			3,492,673.95

Total cost to June 30, 1908, distributed to principal physical features

Pathfinder reservoir (land submerged)-----	\$79, 695. 75
Pathfinder dam and spillway:	
Rock and concrete work-----	527, 038. 25
Dike-----	1, 315. 25
Gates-----	109, 901. 65
Outlet tunnel-----	38, 109. 27
North Platte pile bridge-----	3, 881. 38
General expense-----	43, 439. 55
Whalen diversion dam-----	191, 997. 06
Interstate canal:	
Temporary diversion dam-----	4, 755. 29
Lands for canal-----	15, 458. 10
Earthwork, first 45 miles, main canal-----	608, 878. 58
Structures, first 45 miles, main canal-----	316, 305. 89
Earthwork, second 50 miles, main canal-----	624, 547. 60
Structures, second 50 miles, main canal-----	177, 125. 35
Preliminary surveys, third 50 miles, main canal-----	6, 655. 82
General expense-----	66, 426. 19
First lateral distributing system (earthwork and structures)-----	245, 329. 19
Second lateral distributing system (earthwork and structures)-----	130, 793. 27
Land lines and right of way-----	2, 032. 14
Buildings (offices, dormitories, warehouses, etc.)-----	38, 435. 98
Experimental farm-----	126. 99
Operation and maintenance-----	37, 316. 38
Hydrography-----	123. 94
Irrigable lands:	
Farm unit subdivision and soil examination-----	12, 536. 91
Topography-----	17, 122. 72
Examination Sweetwater reservoir-----	10, 100. 00
Examination Goshen Hole, Fort Laramie, and Alcover-Casper canals-----	19, 174. 36
Administration of project as a whole-----	53, 611. 87
<hr/>	
Total building cost as per debit in cost of work in statement of assets and liabilities-----	3, 382, 034. 73

NEVADA
TRUCKEE-CARSON PROJECT

GENERAL STATEMENT

The principal data relating to the Truckee-Carson project are summarized as follows:

Counties: Churchill, Lyon, and Storey.
Townships: 16 to 24 N., Rs. 21 to 31 E., M. D. M.
Irrigable area: 200,000 acres (first unit). Ownership, 70 per cent public, remainder private.
Average elevation of irrigable area: 3,950 feet above sea level.
Average annual rainfall on irrigable area: 4 inches.
Range of temperature on irrigable area; Maximum, 112°; minimum, -12°.
Character of soil of irrigable area: Sandy loam, clay loam, and volcanic ash.
Duty of water: 3 acre-feet per acre per annum.
Size of farm units: 80 acres.
Principal products: Alfalfa, cereals, vegetables, and fruits.
Railroad stations: Fallon, Hazen, and Wadsworth, Nev.
Railroad: Southern Pacific.
Watershed area: 3,450 square miles.
Average annual rainfall on watershed: 25 inches.
Estimated annual run-off of watershed: 1,000,000 acre-feet.
Reservoirs: Lake Tahoe, area, 193 square miles; capacity, 200,000 acre-feet.
Alkali Flat, area, 8,000 acres; capacity, 220,000 acre-feet. Lower Carson, area, 11,000 acres; capacity, 286,500 acre-feet.
Storage dams: Lake Tahoe, type, concrete regulator; height, 10 feet; length, 140 feet. Lower Carson, not designed.
Diversion dams: Truckee River, type, concrete regulator; height, 25 feet; length, 155 feet. Carson River, type, concrete regulator; height, 15 feet; length, 225 feet.
Main canals: First unit, length, 180 miles.
Laterals: First unit, length, 430 miles.
Dikes: First unit, length, 50,000 feet.
Power development: Plans not determined.
Construction of project authorized: March 14, 1903.
Per cent of project completed: First unit, 90.

A detailed description of the Truckee-Carson project will be found in the fifth annual report, and general descriptions relating to the project are given in all of the other annual reports. Briefly, the irrigation plan of the Truckee-Carson project involves the construction of a dam at the outlet of Lake Tahoe, converting the lake into a storage reservoir; a diversion dam on the Truckee River at a point about 40 miles below the storage dam at Lake Tahoe; a canal taking water from the Truckee River at the right end of the diversion dam and supplying water to lands in the Carson and lower Truckee River valleys and to the Lower Carson reservoir on the Carson River; a dam on the Carson River creating the Lower Carson reservoir; a diversion dam on the Carson River at a point about 5 miles below the Lower Carson reservoir or storage dam; two canals, one on each side of the Carson River heading at the diversion dam, watering lands in the lower Carson River Valley; a diversion dam on the Carson

River near Dayton, Nev.; two canals, one on each side of the river, the one on the right side watering lands in the Carson River Valley and supplying water to the Alkali Flat reservoir, a natural reservoir near Howard, Nev.; a diversion dam on the Carson River at a point about 3 miles below the outlet of Alkali Flat reservoir; and two canals, one on each side of the river, watering lands in the Carson River Valley below Churchill. The diversion dam on the Truckee River, the diversion canal carrying water from this point over the divide into the Carson River, and the diversion dam on the Carson River below the Lower Carson reservoir are completed. The canal systems diverting water from the Carson River at this latter diversion dam are under construction and are practically completed. The remaining features of the project remain yet to be constructed. The canals and laterals are completed for delivering water to about 100,000 acres of land. No further extension of the canals or laterals will be made until reservoirs for storage of flood waters are built.

FORCE ACCOUNT CONSTRUCTION

During the fiscal year construction of canals and structures therefor has been carried on in districts 3, 4, 5, and 7 by force account.

COOPERATIVE CONSTRUCTION

Immediately upon the approval of the plan of cooperative construction an agreement was entered into between the Reclamation Service and the Truckee-Carson Farmers' Association for the completion of the lateral system from Hazen to Wadsworth, in district 7. The work was divided into 32 small sections, averaging about 1,000 cubic yards of excavation each. On the first advertisement contracts were let for 23 of these sections. Work has been commenced on these cooperative contracts and is progressing satisfactorily.

HYDROGRAPHIC STUDIES

Extensive studies of the hydrography of the project have been made, in order to plan for the most complete development of irrigation and power. These studies have shown the necessity of making certain changes in the previously published plans for development of the project.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Truckee-Carson project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
2	C. A. Warren & Co.....	Main canal, division 1.....	\$303,417.00	\$481,001.96	Feb. 2, 1905
16	San Francisco Construction Co.	Distributing canals, structures.	43,220.00	66,242.49	May 3, 1905
71	Pacific Portland Cement Co..	Cement.....	3,490.65	3,490.65	.....

LANDS OPENED FOR IRRIGATION

On May 6, 1907, approved plats of 9 townships designating about 74,829 acres of land irrigable under the Truckee-Carson project, Nevada, were forwarded to the Commissioner of the General Land Office with the following public notice:

PUBLIC NOTICE DATED MAY 6, 1907

In pursuance of the provisions of section 4 of the reclamation act of June 17, 1902 (32 Stat. L., 388), notice is hereby given that water will be furnished from the Truckee-Carson project in Nevada, under the provisions of the reclamation act, for the irrigating season of 1908 for lands designated upon farm unit plats of: T. 20 N., R. 24 E., M. D. M.; T. 20 N., R. 25 E., M. D. M.; T. 20 N., R. 26 E., M. D. M.; T. 19 N., R. 26 E., M. D. M.; T. 19 N., R. 27 E., M. D. M.; T. 18 N., R. 28 E., M. D. M.; T. 19 N., R. 28 E., M. D. M.; T. 18 N., R. 29 E., M. D. M.; T. 19 N., R. 29 E., M. D. M.; approved by the Secretary of the Interior March 14, 1908, and on file in the local land office at Carson City, Nev.

The limit of area per entry representing the acreage which, in the opinion of the Secretary of the Interior, may be reasonably required for the support of a family on the lands in question is fixed for the lands entered, subject to the provisions of the reclamation act, at the amounts shown upon the plats for the several farm units.

The limit for which water-right application may be made for lands in private ownership shall be 160 acres of irrigable land for each landowner.

The charges which shall be made per acre upon the said entries and upon lands in private ownership which can be irrigated by the waters of the said irrigation project, are in two parts, as follows:

(1) The building of the irrigation system, \$22 per acre, payable in not less than five, nor more than ten, annual installments, each not less than \$2.20 per acre.

(2) For operation and maintenance, which will, as soon as the data are available, be fixed in proportion to the amount of water used, with a minimum charge per acre whether water is used thereon or not. The operation and maintenance charges for the irrigation season of 1907 and until further notice will be 40 cents per acre of irrigable land.

The first installment of said charges for all irrigable areas shown on these plats, whether or not water-right application is made therefor or water is used thereon, shall be due and payable on or before December 1, 1907, at the local land office at Carson City, Nev., the total payment for 1907 being not less than \$2.60 per acre. The building charge for subsequent years shall be due and payable at the same place on or before December 1, and the operation and maintenance charge shall become due as announced by the the Secretary of the Interior each year.

INSTRUCTIONS ACCOMPANYING PUBLIC NOTICE

This notice was accompanied by request that the local land officers be instructed to give publicity to the notice and to announce that water-right applications must be filed in the proper form in the local land office before water can be furnished; that the United States will operate the storage and diversion dams and main headworks, main canals, and main laterals, as shown on a plat of the project approved by the director, copy of which is on file in the office of the engineer in charge of the project, the sublaterals constituting the rest of the distributing system to be maintained by the water users, to be served therefrom at their own expense, under regulations to be approved by the Secretary of the Interior; that the amount of water to be furnished is 3 acre-feet per acre per annum; that the building charge and number of installments are to be stated in the third paragraph

of each application; and that no water users' association has been established under the project, and therefore the certificate of the association forming part of the application can not be filled in.

ORDER DATED NOVEMBER 1, 1907

In pursuance of the public notice issued under the provisions of the reclamation act for the Truckee-Carson project, Nevada, under date of May 6, 1907, it is hereby ordered:

1. That the charge for building the irrigation system for all lands entered on or after January 1, 1908, will be \$30 per acre, payable in not less than 5 nor more than 10 annual installments, each not less than \$3 per acre.

2. That all entries made on or after January 1, 1908, shall be accompanied by applications for water right in due form and by the first installment of the charge for building, operation, and maintenance, and that all applications for water right made on or after January 1, 1908, by parties holding land in private ownership under the project shall be subject to a building charge of \$30 per acre and must be accompanied by the first installment of the charge. The charge for operation and maintenance having been fixed at 40 cents per acre until further notice, the first installment so payable will be not less than \$3.40 per acre of irrigable land. Subsequent installments shall be payable as provided in section 1 of this order and in the said public notice, the second installment being due and payable on or before December 1 of the year subsequent to that in which the water-right application is filed.

3. That for all land filed upon in any year on or before June 15, and for applications for water rights for land in private ownership filed on or before the same date, the charges shall be collected for that irrigating season. But when the filing is made subsequent to that date in any year, so much as may be paid on account of operation and maintenance shall be a credit on the installment for the next year.

4. That the charges herein provided for may, for the convenience of applicants, be paid to and received by the special fiscal agent of the Reclamation Service at Fallon, Nev., for transmission to the receiver of the United States land office at Carson City, Nev. (as amended December 20, 1907).

5. As heretofore provided, no water will be delivered to any land under the project for which a water right application has not been filed in due form and upon which all charges for each acre of irrigable land have not been paid as required by the public notice and this order, whether water had been used upon said lands or not.

This order is to be regarded as additional and supplementary to the public notice issued May 6, 1907, which will continue in force except as herein modified.

ORDER DATED JANUARY 30, 1908

In pursuance of the public notice issued under the provisions of the reclamation act for the Truckee-Carson project, Nevada, under date of May 6, 1907, it is hereby ordered:

1. That such part of the charge for the project as has been fixed for operation and maintenance for the irrigation season of 1907, namely, 40 cents per acre, may be paid independently of the building charge.

2. In pursuance of the authority contained in section 10 of the reclamation act for the establishment of rules and regulations necessary and proper for the purpose of carrying the provisions of the act into full force and effect, the following rule is promulgated for said project: That all charges due for operation and maintenance must be paid for all the irrigable land included in any water right application on or before April 1 of each year, in default of which no water will be furnished for the irrigation of such lands.

LANDS OPENED FOR IRRIGATION

On April 4, 1908, approved plats of two additional townships designating about 6,518 acres of land irrigable under this project were forwarded to the Commissioner of the General Land Office with the following public notice:

PUBLIC NOTICE DATED APRIL 4, 1908

Subject to the terms and provisions of public notice dated May 6, 1907, and orders supplemental thereto, notice is hereby given in pursuance of section 4 of the reclamation act of June 17, 1902 (32 Stat. L., 388), that water will be furnished under the Truckee-Carson project beginning with the irrigation season of 1908 for additional lands designated upon farm unit plats approved by the Secretary of the Interior and on file in the land office at Carson City, Nev., in the following townships: T. 18 N., R. 30 E., M. D. M.; T. 19 N., R. 30 E., M. D. M.

INSTRUCTIONS ACCOMPANYING PUBLIC NOTICE

This public notice was accompanied by a request that the local land officers be guided in their action respecting the lands covered by the notice in accordance with instructions given in connection with the public notice of May 6, 1907, and the supplementary orders.

ORDER DATED JUNE 5, 1908

1. By the order of November 1, 1907, the building charge for the Truckee-Carson project for homestead entries made on or after January 1, 1908, and for water-right applications for land in private ownership filed on or after that date were increased to \$30 per acre.

2. Where an entryman filed application for a water right prior to January 1, 1908, and made payments thereon at the lower rate and relinquished his entry, the land being taken by a new entryman to whom the former entryman has assigned his interest in his payments on the water right, the new entryman will not be required to file a new water-right application and will be entitled to make payment of the building charge at the rate of \$22 per acre, subject to the provisions of General Land Office circular of January 18, 1908.

3. In the case of land in private ownership for which water-right application was filed at the building charge of \$22 per acre and payment has been made thereon, the purchaser of all or any part of this land will be entitled to make payment at the same rate without filing a new water-right application.

4. In the case of an entryman or a private landowner who filed application for a water right at the lower rate, the assignee of either would be entitled to make payment at the same rate without filing a new water-right application.

5. Where a homestead entry was made under the reclamation act prior to January 1, 1908, upon lands for which water-right application could have been filed prior to that date, but no such application was filed, such entryman may, after January 1, 1908, file a water-right application at the lower rate as if filed prior to January 1, 1908, provided that the same be filed within thirty days after notice by the engineer of the Reclamation Service that the irrigation system is prepared to furnish water as needed for the irrigation of the land.

6. Where a private landowner holds lands for which water-right application could have been filed prior to January 1, 1908, and he failed to do so, an application for a water right subsequent to January 1, 1908, can be filed at the lower rate only in case the Government was not ready to furnish water to the land in the season of 1907, and in case the private landowner had prior to January 1, 1908, adjusted his claim to vested water right if he had any; provided, that such water-right application be filed within thirty days after notice by the engineer of the Reclamation Service that the irrigation system is ready to furnish water as needed for the irrigation of the land.

SETTLEMENT

The settlement of the Truckee-Carson project has been slow. Many settlers have arrived without capital or experience, and many of them have failed. Capital is a necessity in making a farm on the desert and the man who undertakes such an enterprise without it is almost sure to fail. Much of the land that eventually becomes the most fertile produces little or nothing the first year, following the

history of nearly every irrigated district in the West. The recent settlers are men with more capital and experience. Of the 81,347.09 acres opened by the public notices of May 6, 1907, and April 4, 1908, 42,661.10 acres are public and 38,685.99 acres private. The public lands are divided into 618 farm units and water-right applications for 261 of these farm units, covering 15,958.10 acres, have been filed. Seventy-three water-right applications, covering 8,692 acres of the private lands, have been filed.

OPERATION

In the fall of 1907 water was carried in the canals of the project until late in the year in order to assist new settlers in preparing ground for the season of 1908 and to furnish domestic water in certain localities where it seems difficult to obtain good well water. Immediately after the close of the irrigation season all necessary repair work was hastened as rapidly as possible. The canals damaged by the flood of March, 1907, had been temporarily repaired at that time and in many places required more thorough repairs to put them in their original good condition. All repairs were satisfactorily completed in time to turn water into the canals early in the spring of 1908.

The weather during the winter months was most excellent and many of the farmers were busy all winter in getting land in condition for the planting of crops. The snowfall in the mountains was light, and the water supply promised to be low during 1908. Only one snowfall station is situated in such a place as to enable a good estimate to be made of the amount of snow in the mountains. This station is located at Summit, on the Southern Pacific Railroad. Other stations are badly needed, and it is hoped that they can be established during 1908. Nearly all of the water in the Carson River was diverted for irrigation after April 1 and the Truckee canal was used to supplement the flow from the Carson River after that date.

At the close of the fiscal year the natural flow of both streams combined was insufficient to supply irrigation demands, and water was drawn from Lake Tahoe. Owing to the uncompleted state of the negotiations concerning the sale of the outlet, some delay was experienced in having the lake gates raised. When water was started from the lake, a part of it was diverted by various ditches in Reno Valley, and in consequence the supply at the headworks of the Truckee canal was never adequate for the irrigation demands. A settlement of water rights along the Truckee River has never been made by the state authorities, and consequently it was not possible to prevent the diversion of the stored water by the Reno Valley irrigators without taking legal steps. The state engineer of Nevada promises to adjust the rights of all appropriators; so that when another dry season occurs the Reclamation Service will receive all the water to which it is legally entitled.

The available water in Lake Tahoe was insufficient to supply more than 500 second-feet of water for the balance of the irrigation season, because the gates had been up all winter and, consequently, at the time storage should have been going on, the water was allowed to waste. On April 17 the elevation of the water surface of the

lake was 6,226.60 feet above sea level, and the highest for the summer was 6,228.10 feet June 30, showing storage of only 186,000 acre-feet for the period when ordinarily the greatest storage takes place. Had the water that was wasted during the winter of 1907-8 been stored, there would have been a much better supply in spite of the Reno Valley diversions. Negotiations for the purchase of the outlet of Lake Tahoe are progressing satisfactorily. The purchase of this outlet by the Reclamation Service and the adjustment of water rights along the Truckee River by the state engineer will do much to improve the water supply for the Truckee canal.

AGRICULTURAL DEVELOPMENT AND PROGRESS

An agricultural census was taken during the fall of 1907, the results of which showed on November 1, 1907, a total irrigated acreage of 20,685 acres, distributed as follows: Pasture, approximately, 10,000 acres; alfalfa and wild hay, 8,580 acres; grain, 1,800 acres; potatoes, 155 acres; garden, 115 acres; and fruit, 33 acres.

Although the winter weather preceding the spring of 1908 was most propitious, the spring was cold and backward, and a number of heavy winds caused much damage to new lands. Farmers who have lived in the valley for thirty years say that the spring of 1908 was one of the worst ever known here. In spite of the frost and wind, together with poor growing weather, considerable new land was planted, and on June 30, 1908, a midsummer census was made in order to determine the acreage and condition of crops, the results of which showed the total irrigated acreage to be 27,450 acres, distributed as follows: Pasture, 10,000 acres; alfalfa and wild hay, 12,500 acres; grain, 4,000 acres; potatoes, 500 acres; garden, 200 acres; fruit, 150 acres; miscellaneous crops, 100 acres.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected freight refunds.....	\$171. 89		\$302, 653. 08
Uncollected miscellaneous.....	925. 66		
Uncollected water right building charges.....	57, 718. 84		
Uncollected water right operation and maintenance charges.....	3, 836. 69		
Inventories:			
Mercantile stores.....	56. 59		79, 754. 56
Government animals.....	14, 055. 64		
Equipment in use.....	23, 235. 08		
Storehouse.....	41, 407. 25		
Fuel.....	1, 000. 00		
Cost of work:			
Building cost.....	3, 691, 115. 14		3, 625, 431. 52
Less adjustments.....		\$5, 906. 98	
Less accrued repayments.....		59, 776. 64	
	3, 691, 115. 14	65, 683. 62	
Operation and maintenance cost.	124, 821. 07		114, 961. 03
Less accrued repayments.....		9, 860. 04	
	124, 821. 07	9, 860. 04	
Total.....			3, 882, 800. 19

Assets and liabilities on June 30, 1908—Continued

Items.	Debits.	Credits.	Amounts.
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		\$19.62	\$21,952.37
Unpaid purchases.....		2,353.37	
Unpaid contract holdbacks.....		10,386.95	
Unpaid freight and express.....		9,066.33	
Unpaid passenger fares.....		126.10	
Investment of the United States:			
Disbursement vouchers.....		3,745,932.06	
Collection vouchers.....	\$20,550.09		
Transfer vouchers received.....		151,725.79	
Transfer vouchers issued.....	16,259.94		
	36,810.03	3,897,657.85	3,860,847.82
Total.....			3,882,800.19

Total cost to June 30, 1908, distributed to principal physical features

Lake Tahoe reservoir.....	\$2,160.73
Upper Truckee canal location.....	6,189.63
Main Truckee canal (earthwork and structures).....	1,534,275.40
Pyramid Lake canal (preliminary location).....	2,258.86
Power-house drop.....	61,843.29
Lower Carson diversion dam.....	82,222.92
Distributing system:	
Main laterals.....	407,751.13
Old river channel straightening.....	123,113.89
Lateral and drainage system.....	1,129,109.58
Bridges.....	271.20
Lovelock canal (preliminary location).....	11,594.40
Flood expense.....	73,550.02
Real estate, rights, and property.....	52,202.29
Buildings (offices, dormitories, warehouses, etc.).....	39,195.66
Telephone system.....	35,591.02
Experimental farm.....	5,426.82
Examination of project as a whole.....	123,020.28
Cost ledger inventories.....	1,338.02

Total building cost as per debit in cost work in statement of
assets and liabilities..... 3,691,115.14

WALKER RIVER PROJECT

A detailed description of the Walker River project will be found in the fifth annual report. The expenditures on this project for the fiscal year have been for supplies amounting to \$1.53, making a total expenditure to June 30, 1908, of \$12,221.82.

NEW MEXICO

CARLSBAD PROJECT

GENERAL STATEMENT

The principal data relating to the Carlsbad project are summarized as follows:

County: Eddy.

Townships: 21 S., Rs. 26 and 27 E.; 22 S., Rs. 26, 27, and 28 E.; 23 S., Ra. 27 and 28 E.; 24 S., R. 28 E., N. M. M.

Irrigable area: 20,000 acres. Ownership, private.

Average elevation of irrigable area: 3,100 feet above sea level.

Average annual rainfall on irrigable area: 14 inches.

Range of temperature on irrigable area: Maximum, 110°; minimum, 0°.

Character of soil of irrigable area: Fertile alluvium.

Duty of water: 3 acre-feet per acre per annum.

Size of farm units: 160 acres.

Principal products: Alfalfa, corn, cotton, apples, peaches, grapes, melons, and vegetables.

Railroad stations: Carlsbad, Otic, Florence, and Malaga, N. Mex.

Principal railroads: Eastern Railway of New Mexico (Santa Fe System).

Principal markets: Carlsbad, N. Mex.; Fort Worth, Tex.; Denver, Colo.; and Chicago, Ill.

Watershed area: 22,000 square miles.

Average annual rainfall on watershed: 15 inches.

Estimated annual run-off of watershed: 150,000 acre-feet.

Reservoir: Area, 3,240 acres; capacity, 15,170 acre-feet.

Storage dam: Type, earth and rock fill; height, 52 feet; length, 1,686 feet.

Diversion dam: Type, earth and rock fill with concrete core wall; height, 48 feet; length, 1,000 feet.

Main canals: Length, 34½ miles.

Laterals: Length, 112 miles.

Construction of project authorized: February 24, 1906.

Per cent of project completed: 98.

A detailed description of the Carlsbad project will be found in the fourth annual report, and general descriptions relating to the project are given in the fourth, fifth, and sixth annual reports. Briefly, the irrigation plan of this project involves the reconstruction of the McMillan storage reservoir at Lake McMillan on the Pecos River near McMillan, N. Mex., the Avalon storage and distributing reservoir on the same river near Lake View, N. Mex., and the existing related canal system. The diversion canal takes water from the left side of the Pecos River at the Avalon dam controlling the Avalon reservoir, and divides at about 18 miles below the headworks, one branch covering lands on the left side and the other branch covering lands on the right side of the Pecos River in the vicinity of Carlsbad. The reconstruction of the canals and of the Avalon reservoir is completed and the work on the McMillan reservoir will soon be undertaken.

CONSTRUCTION WORK

The canals, laterals, head gates, spill gates, and the Avalon dam have been completed during the fiscal year, and there remains to complete the project only the work at Lake McMillan.

PRINCIPAL CURRENT CONTRACT

The following statement contains data relating to the principal contract in operation during the fiscal year ending June 30, 1908:

No. 223; contractor, United Kansas Portland Cement Company; feature, cement; estimated value, \$289.58; estimated earnings June 30, 1908, \$289.58; completion due, October 1, 1908.

LANDS OPENED FOR IRRIGATION

On December 17, 1907, approved plats of 8 townships designating 20,073 acres of land irrigable under the Carlsbad project, New Mexico, were forwarded to the Commissioner of the General Land Office with the following public notice:

PUBLIC NOTICE DATED DECEMBER 17, 1907

In pursuance of the provisions of section 4 of the reclamation act of June 17, 1902 (32 Stat. L., 388), notice is hereby given as follows:

Water will be furnished from the Carlsbad project in New Mexico under the provisions of the reclamation act in the irrigation season of 1908 for the irrigable land shown upon plats of Tps. 21 and 22 S., R. 26 E.; Tps. 21, 22, and 23 S., R. 27 E.; Tps. 23 and 24 S., R. 28 E.; and T. 23 S., R. 29 E., approved December 14, 1907, by the Secretary of the Interior and on file in the local land office at Roswell, N. Mex.

Homestead entries accompanied by applications for water rights may be made under the provisions of the said act for any vacant public irrigable lands shown on said plats.

The limit of area for which water-right application may be made for lands in private ownership shall be 160 acres of irrigable land for each landowner.

The charges which shall be made per acre of irrigable land which can be irrigated by the waters from the said irrigation project are in two parts, as follows:

1. The building of the irrigation system, \$31 per acre of irrigable land, payable in not less than five nor more than ten annual installments, each not less than \$3.10 per acre.

2. For operation and maintenance, which will as soon as data are available be fixed in proportion to the amount of water used, with a minimum charge per irrigable acre, whether water is used thereon or not. The operation and maintenance charges for the irrigation season of 1908 and until further notice will be 75 cents per acre of irrigable land whether water is used thereon or not.

The first payment on account of said charges for all irrigable areas shown on these plats, whether or not water-right application is made therefor or water is used thereon, shall be due and payable at the local land office at Roswell, N. Mex., on or before March 1, 1908, the total payment being not less than \$3.85 per acre. Any entry of public lands made after that date must be accompanied by a water-right application and a first payment of \$3.85 per acre.

The building charge for subsequent years shall be due and payable at the same place on or before March 1, of each year, and until further notice the operation and maintenance charge of 75 cents per acre of irrigable land per annum shall be due and payable at the same time and place.

The charges herein provided for may, for the convenience of applicants, be paid to and received by the special fiscal agent of the United States Reclamation Service at Carlsbad, N. Mex., for transmission to the receiver of the United States land office at Roswell, N. Mex., on or before the dates specified herein for payment at the local land office.

INSTRUCTIONS ACCOMPANYING PUBLIC NOTICE

This notice was accompanied by a request that the local land officers be instructed to give publicity to the notice and to announce that water-right applications must be filed in the proper form in the local land office before water can be furnished; that the United States will operate and maintain the storage and diversion dams and main laterals as shown on a plat of the project approved by the director, copy of which is on file in the office of the engineer in charge of the project, the cost thereof to be included in the operation and maintenance charges; that the necessary sublaterals constituting the rest of the distributing system are to be operated and maintained by the water users to be served therefrom at their expense under regulations to be approved by the Secretary of the Interior; that the amount of water to be furnished is 3 acre-feet per acre per annum; that the building charge and number of annual installments are to be stated in the third paragraph of each application; and that the Secretary of the Interior has entered into a contract with the Pecos Water Users' Association, and the certificate of that association forming part of the water-right application must be filled in before the application can be accepted.

SETTLEMENT

Of the 20,073 acres of land opened by the public notice of December 17, 1907, 20,053 acres are private and 20 acres public. Two water-right applications have been made covering all of the public land, and 117 applications have been made covering 7,557 acres of the private land. On June 30, there were 7,637 acres in actual cultivation on the project, the acreage in different crops being as follows: Alfalfa, 2,827; garden truck, 72; orchard, 679; grass and cereals, 471; corn and sorghum, 1,841; cotton, 1,747.

IRRIGATION RESULTS

All crops are doing remarkably well this season. About 400 acres of young peach trees were planted on the project during the past two years, and a considerable acreage will be planted next year. Peaches, pears, and grapes seem to be the fruits best adapted to the lands and climate of the project. The prospects are good for a large cotton crop and an excellent yield of grapes. Considerable land has been sold during the past few months. This land has been generally purchased by men possessed of means who have shown considerable activity in making improvements. A large acreage will be planted to alfalfa and grain this fall. It is expected that the irrigated acreage will be nearly doubled by next spring.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected water right building charges.....	\$23,488.70		\$29,171.45
Uncollected water right operation and maintenance charges.....	5,682.75		
Inventories:			
Equipment in use.....	22,557.98		28,622.63
Storehouse.....	5,333.38		
Cement.....	691.27		
Forage.....	40.00		
Cost of work:			
Building cost.....	578,235.94		562,406.64
Plus adjustments.....	10,689.86		
Less accrued revenues.....		\$9,030.46	
Less accrued repayments.....		23,488.70	
	594,925.80	32,519.16	
Operation and maintenance cost.....	9,455.24		3,772.49
Less accrued repayments.....		5,682.75	
	9,455.24	5,682.75	
Total.....			623,973.21
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		917.55	7,801.61
Unpaid purchases.....		91.58	
Unpaid freight and express.....		6,479.80	
Unpaid passenger fares.....		112.68	
Investment of the United States:			
Disbursement vouchers.....		618,072.00	616,371.60
Collection vouchers.....	11,649.27		
Transfer vouchers received.....		13,126.38	
Transfer vouchers issued.....	3,177.51		
	14,826.78	631,198.38	
Total.....			623,973.21

Final cost to June 30, 1908, distributed to principal physical features

Pecos Valley irrigation system (purchase price).....	\$150,434.55
McMillan reservoir.....	3,322.10
Avalon diversion dam.....	184,608.74
Main canal:	
Earthwork.....	60,477.76
Canal structures.....	23,208.81
East side canal.....	4,104.34
Flume (concrete).....	15,197.45
Dark Canyon inverted siphon.....	33,188.90
Black River cut-off canal.....	12,441.96
Black River diversion.....	6,182.30
Lateral distribution system.....	12,319.52
Experimental farms.....	780.93
Irrigable lands (farm-unit subdivisions and soil examination).....	8,600.19
Examination of project as a whole.....	19,597.29
Administration of project as a whole.....	43,771.10

Total building cost as per debit in cost of work in statement
of assets and liabilities..... 578,235.94

HONDO PROJECT

GENERAL STATEMENT

The principal data relating to the Hondo project are summarized as follows:

County: Chaves.
 Townships: 10 to 13 S., Rs. 22 to 25 E., N. M. M.
 Irrigable area: 10,000 acres. Ownership, private.
 Average elevation of irrigable area: 3,900 feet above sea level.
 Average annual rainfall on irrigable area: 15 inches.
 Range of temperature on irrigable area: Maximum, 100°; minimum, -10°.
 Character of soil of irrigable area: Fertile alluvium.
 Duty of water: 2½ acre-feet per acre per annum.
 Size of farm units: 160 acres.
 Principal products: Alfalfa, corn, fruits, and vegetables.
 Railroad station: Roswell, N. Mex.
 Railroad: Eastern Railway of New Mexico (Santa Fe system).
 Principal markets: Roswell, N. Mex.; Amarillo and Fort Worth, Tex.; and Chicago, Ill.
 Watershed area: 1,037 square miles.
 Average annual rainfall on watershed: 15 inches.
 Estimated annual run-off of watershed: 40,000 acre-feet available for storage.
 Reservoir: Area, 1,910 acres; capacity, 40,000 acre-feet.
 Storage dams: Type, earthen embankments (six); total length, 16,504 feet.
 Diversion dam: Type, earth fill; length, 100 feet; height, 20 feet.
 Main canals: Length, 10.2 miles.
 Laterals: Length, 20.2 miles.
 Construction of project authorized: November 10, 1903.
 Per cent of project completed: 100.

A detailed description of the Hondo project will be found in the third annual report, and general descriptions relating to the project are given in the second, fourth, fifth, and sixth annual reports. Briefly, the irrigation plan of this project involves the construction of a diversion dam on the Hondo River about 10 miles southwest of Roswell, N. Mex., diverting water through a short inlet canal into a natural storage reservoir, the capacity of which has been increased by the construction of embankments. The water stored in the reservoir is discharged back into the Hondo River and diverted into a canal on the south side of the river by means of a small diversion dam about 2 miles below the reservoir and onto lands on the north side of the river by means of a small diversion dam about 4 miles below the outlet of the reservoir.

OPERATION

Although the construction of this project has been finished for practically two irrigating seasons, there has not been sufficient water available to warrant the Secretary in opening the project, owing to an unprecedented drought on the watershed. Such water as has been available has been used on the lands without having been stored in the reservoir. There are between 1,500 and 1,600 acres in cultivation during the season of 1908. During the first part of the season there was sufficient water for the irrigation of this acreage, but by June 30 there was no available water and the crops were very much in need of it.

The work performed on the project during the past year has been that of distributing such water as was available and maintenance and

repairs of the system. The low flow has made the operation of taking care of the silt expensive, as it requires considerable flow to operate successfully the slit-clearing devices.

DEVELOPMENT

The project land is very fertile, and the owners are all anxious to cultivate it. Even in face of the drought the owners have kept up good spirits, and the price of land has held up remarkably well. This condition is perhaps partially due to the fact that the artesian wells, located in the Roswell artesian basin, situated a few miles to the east of this project, have been showing a gradual decline in pressure, and some of those situated on the higher levels have ceased to flow. Many predict, and it seems a safe prediction, that the entire artesian district will fail, and many farms now in a high state of cultivation will have to depend on pumping for a water supply. Since the supply may be exhausted, flood storage is the only source of relief, and the Hondo reservoir will find ample use.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items	Debits.	Credits.	Amounts.
ASSETS.			
Cost of work:			
Building cost.....	\$362,159.86		
Plus adjustments.....	176.84		
Less accrued revenues.....		\$1,004.05	
	362,336.70	1,004.05	\$361,332.65
Total.....			361,332.65
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		354.62	607.27
Unpaid purchases.....		15.60	
Unpaid freight and express.....		94.88	
Unpaid passenger fares.....		142.17	
Investment of the United States:			
Disbursement vouchers.....		353,462.16	
Collection vouchers.....	2,193.06		
Transfer vouchers received.....		9,997.46	
Transfer vouchers issued.....	541.18		
	2,734.24	363,459.62	360,725.38
Total.....			361,332.65

Total cost to June 30, 1908, distributed to principal physical features

Inlet canal, headworks and earthwork.....	\$65,018.43
Storage reservoir:	
Reservoir and embankment.....	106,693.89
Real estate (rights and property).....	21,340.96
Outlet canal, earthwork and embankment.....	64,615.14
Diversion dam (rock excavation).....	35,536.31
Distribution system.....	38,389.41
Operation and maintenance.....	4,818.90
Office building.....	1,738.99
Telephone system.....	4,170.42
Preliminary examination and farm-unit subdivision.....	19,837.41

Total building cost as per debit in cost of work in statement
of assets and liabilities..... 362,159.86

LA PLATA PROJECT

A general description of the La Plata project will be found in the third annual report. All lands withdrawn in connection with this project have been restored to entry. The expenditures on the project for the fiscal year have been for advertising, amounting to \$82.83, making a total expenditure to June 30, 1908, of \$28,051.

LAS VEGAS PROJECT

A general description of the Las Vegas project will be found in the third annual report. The expenditures on this project for the fiscal year have been for services and gaging streams, amounting to \$252.46, making a total expenditure to June 30, 1908, of \$5,012.59.

URTON LAKE PROJECT

A brief general description of the Urton Lake project will be found in the second annual report. The expenditures on this project for the fiscal year have been for services, traveling, and gaging streams, amounting to \$383.99, making a total expenditure to June 30, 1908, of \$17,792.22.

NEW MEXICO-TEXAS

RIO GRANDE PROJECT

GENERAL STATEMENT

The principal data relating to the Rio Grande project are summarized as follows:

Counties: Dona Ana, Luna, Sierra, and Socorro, N. Mex., and El Paso, Tex.
Irrigable area: 155,000 acres. Ownership, private.
Average elevation of irrigable area: 3,850 feet above sea level.
Average annual rainfall on irrigable area: 9.5 inches.
Range of temperature on irrigable area: Maximum, 110°; minimum, 0°.
Character of soil of irrigable area: Fertile alluvium.
Duty of water: 2½ acre-feet per acre per annum.
Size of farm units: 160 acres.
Principal products: Alfalfa, corn, fruit, vegetables, and melons.
Railroad stations: Rincon and Las Cruces, N. Mex.; and El Paso and Ysleta, Tex.
Railroads: Atchison, Topeka and Santa Fe; El Paso and Southwestern; and Southern Pacific.
Principal markets: El Paso, Tex., and other local points.
Watershed area: 37,000 square miles.
Average annual rainfall on watershed: Unknown.
Estimated annual run-off of watershed: 550,000 acre-feet.
Reservoir: Area, 38,000 acres; capacity, 2,000,000 acre-feet.
Storage dam: Type, rubble concrete gravity; height, 255 feet; length, 1,150 feet.
Diversion dam: Leasburg diversion, type, rubble concrete weir; height, 9 feet; length, 600 feet. Other diversion dams not designed.
Main canals: Leasburg diversion, length, 6 miles of new canal.
Laterals: Leasburg diversion, Dona Ana and Las Cruces systems in use.
Earth dike: Leasburg diversion, length, 1,600 feet at Leasburg dam.
Construction of project authorized: Leasburg diversion, December 2, 1905.
Per cent of project completed: Leasburg diversion, 100.

A detailed description of the Rio Grande project will be found in the third annual report and of the Leasburg diversion thereof in the fifth annual report, and general descriptions relating to the project are given in the second, fourth, and sixth annual reports. Briefly, the irrigation plan of the Rio Grande project contemplates the construction of Engle reservoir, controlled by Engle dam, on the Rio Grande at a point about 12 miles west of Engle, N. Mex.; four diversion dams and canal systems, one each diverting water at the head of the Las Palomas Valley at a point about 6 miles below the storage dam, the Rincon Valley at a point about 24 miles below the storage dam, the Mesilla Valley at a point about 60 miles below the storage dam, and the El Paso Valley at a point about 120 miles below the storage dam. The irrigation works required for the Las Palomas and Rincon valleys will be new constructions, those required for the Mesilla and El Paso valleys will supplement and improve existing canal systems. In addition to the 155,000 acres of land irrigated in the United States, the Rio Grande project involves the furnishing

of 60,000 acre-feet of water to Mexico for use on 25,000 acres of land in the El Paso Valley on the Mexican side of the river. The Leasburg diversion covering the Mesilla Valley is completed. The remaining features of the Rio Grande project are yet to be constructed. The features of the Leasburg diversion that were required for supplementing the original irrigation systems in the Mesilla Valley consist of a diversion dam at Leasburg, including an earth embankment, straightening of the river channel below the canal headworks at the dam, 6 miles of canal and headworks at the terminus of this canal for dividing the flow thereof into the old Dona Ana and Las Cruces canals.

ENGLE DAM

A survey party was put into the field during December, 1907, and has completed a topographical and land-ownership survey of the proposed reservoir site near Engle, N. Mex. Surveys have also been made for a railroad from the dam site to a point on the Santa Fe's El Paso line, $4\frac{1}{2}$ miles south of Engle, and for wagon roads and foot trails. A town site has been laid out and locations made for office buildings, power houses, and other structures necessary in carrying out the construction of the dam. Both walls of the dam site have been thoroughly prospected to determine the nature of the materials that will be encountered in the construction of the dam. Plans have been completed for a water-supply plant for domestic and power purposes, and this plant will be built at once. The railroad will soon be constructed and preparation will be made to carry the work of constructing the dam to completion as soon as is compatible with safety and good work.

LEASBURG DIVERSION

The contract for the construction of the Leasburg diversion dam and canal was completed February 14, 1908. Owing to unprecedented high water in the river, extensions of time had been granted to the contractor to that date.

A house has been built near the diversion dam for the use of a watchman, and improvements have been made by force account in some of the structures on the canals.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Rio Grande project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
143	John P. Nelson.....	Diversion dam and canal.....	\$145,431.50	\$143,078.95	Feb. 14, 1908
146	Midland Bridge Co.....	Steel and cast iron.....	2,885.00	a 3,152.46	.....

a Completed.

SETTLEMENT

The titles to the lands under the canal of the Leasburg diversion were so complicated that it was decided that opening the project this year was not feasible, and the canal is being operated on a temporary rental basis for the season of 1908. Clearing of titles, adjudication of property disputes, and farm unit surveys will all be accomplished during the latter part of 1908, and it is expected that the project will be opened before the beginning of the next irrigation season.

IRRIGATION RESULTS

The lands under the Leasburg diversion of the Rio Grande project have been farmed in an indifferent manner for the past sixty years. The insecurity of the headworks of the private canals and the consequent uncertainty of an adequate water supply overcame the courage of the farmers and only partial success was attained. During the season of 1908, prior to June 30, the farmers received a constant and ample supply of water and had about 17,000 acres in successful cultivation. The permanency of the new headworks built by the Reclamation Service and the assurance of water when the river flows has given new courage to the resident farmers and has induced others to purchase farms. The output of farm products this year in the district will undoubtedly be much larger than in any previous season.

FINANCIAL STATUS AND FEATURE COSTS

As already stated, the Leasburg diversion is ultimately to become a feature of the Rio Grande project, but, as its authorization was prior to that of the main project and separate allotments have been made therefor, its accounts have been carried independently. The following tables taken together show the financial status and feature costs for the entire project:

Assets and liabilities on June 30, 1908, for Leasburg diversion

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Inventories:			
Government animals.....	\$275. 00	}	\$1,341. 22
Equipment in use.....	476. 50		
Storehouse.....	459. 82		
Cement.....	129. 90		
Cost of work:			
Building cost.....	190,734. 06	}	191,984. 80
Plus adjustments.....	1,250. 74		
Total.....			193,326. 02
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		\$639. 03	1,851. 15
Unpaid purchases.....		179. 12	
Unpaid freight and express.....		941. 60	
Unpaid passenger fares.....		71. 10	
Unpaid miscellaneous.....		20. 30	
Investment of the United States:			
Disbursement vouchers.....		192,938. 37	191,474. 87
Collection vouchers.....	1,473. 26		
Transfer vouchers received.....	5,397. 37	5,407. 13	
Transfer vouchers issued.....	6,870. 63	198,345. 50	
Total.....			193,326. 02

Assets and liabilities on June 30, 1908, for Rio Grande project exclusive of Leasburg diversion

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected miscellaneous.....	\$5.00		\$5.00
Inventories:			
Government animals.....	1,050.00		
Equipment in use.....	3,241.73		
Less depreciation.....		\$188.78	
Storehouse.....	611.26		
Lumber.....	653.89		
Explosives.....	127.15		
Forage.....	296.01		
	5,980.04	188.78	5,791.28
Cost of work:			
Building cost.....	76,110.42		
Plus adjustments.....	684.41		76,694.83
Total.....			82,491.11
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		2,534.24	
Unpaid purchases.....		997.50	
Unpaid freight and express.....		1,380.08	
Unpaid passenger fares.....		149.25	
Unpaid miscellaneous.....		93.85	5,156.92
Investment of the United States:			
Reclamation fund—			
Disbursement vouchers.....		41,930.19	
Collection vouchers.....	28.32		
Transfer vouchers received.....		11,260.42	
Transfer vouchers issued.....	365.00		
	393.32	53,190.61	52,797.29
Appropriation for Rio Grande dam (nonreimbursable):			
Disbursement vouchers.....		24,605.60	
Collection vouchers.....	68.70		
	68.70	24,605.60	24,536.90
Total.....			82,491.11

Total cost to June 30, 1908, for Leasburg diversion, distributed to principal physical features

Diversion dam:		
Concrete weir and abutments.....		\$71,000.03
Embankment at west end.....		5,683.72
Sluice and headgates.....		8,000.71
Main canal:		
Earthwork.....		73,639.45
Sand sluiceway.....		6,107.90
Change of river channel.....		11,876.15
Operation and maintenance.....		2,138.18
Building (gatehouse and dormitory).....		3,717.43
Telephone system.....		388.72
Real estate (rights and property).....		986.75
Preliminary surveys.....		5,776.78
Irrigable lands (farm unit subdivisions).....		1,418.24

Total building cost as per debit in cost of work in statement of assets and liabilities..... 190,734.06

Total cost to June 30, 1908, for Rio Grande project, exclusive of Leasburg diversion, distributed to principal physical features

Preliminary examination and surveys (reclamation fund).....	\$52,797.29
Engle dam and reservoir (Rio Grande dam appropriation).....	23,313.13

Total building cost as per debit in cost of work in statement of assets and liabilities..... 76,110.42

NORTH DAKOTA

BUFORD-TRENTON PROJECT

GENERAL STATEMENT

The principal data relating to the Buford-Trenton project are summarized as follows:

County: Williams.

Townships: 152 and 153 N., Rs. 102 to 104 W., fifth principal meridian.

Irrigable area: 12,500 acres. Ownership, public, 1,200 acres; private, 11,300 acres.

Average elevation of irrigable area: 1,900 feet above sea level.

Average annual rainfall on irrigable area: 15 inches.

Range of temperature on irrigable area: Maximum, 107°; minimum, -59°.

Character of soil of irrigable area: Sandy loam, clay, and light sandy loam.

Duty of water: 2 acre-feet per acre per annum.

Size of farm units: 160 acres.

Principal products: Cereals, alfalfa, sugar beets, vegetables, and small fruits.

Railroad stations: Buford and Trenton, N. Dak.

Railroad: Great Northern.

Principal markets: St. Paul, Minneapolis, and Duluth, Minn.; and Chicago, Ill.

Source of water supply: Pumping from Missouri River.

Main canals: Length, 15 miles.

Laterals: Length, 25 miles.

Power development: 1,500 horsepower delivered from Williston project.

Construction of project authorized: November 18, 1904.

Per cent of project completed: 36.

A detailed description of the Buford-Trenton project will be found in the fifth annual report, and general descriptions relating to the project are given in the second, third, fourth, and sixth annual reports. Briefly, the irrigation plan of this project involves the construction of an electric pumping plant located on a barge in the Missouri River, lifting water into a low-line canal supplying lands in the Missouri Valley between Buford and Trenton, N. Dak., and also supplying water to a pumping plant lifting water to a high-line canal supplying lands in the same vicinity. The pumping stations are operated by electric current delivered from the Williston project, for which a transmission line 28.3 miles in length is at present erected. In the barge pumping station there have been installed four centrifugal pumps each of 30-second-foot capacity, driven by electrical induction motors, and in the secondary station four centrifugal pumps, each of 16-second-foot capacity, two of which are driven by induction and two by synchronous motors. Three 300-kilo-watt water-cooled transformers have been installed for lowering the line voltage from 22,000 to an operating voltage of 2,200.

Most of the conditions existing on the Buford-Trenton project are common to the Williston project, and such features have been described under the latter project.

INSTALLATION OF MACHINERY

All of the pumps and pumping machinery purchased under contract No. 134 have been installed, but the specified tests and satisfactory operation of this machinery have not been completed.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Buford-Trenton project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
134	D'Olier Engineering Co.....	Pumping machinery.....	\$40,836.00	\$41,056.89	Dec. 31, 1907
153	John S. Penson.....	Canals and structures, division D.	3,300.00	*3,277.59	Dec. 1, 1907
154	Penson & King.....	Canals and structures, division A.	20,867.75	*18,363.59	Do.
155	Universal Portland Cement Co.	Cement.....	816.00	816.00	Dec. 31, 1907
159	James Burton.....	Canals and structures, division C.	13,282.50	*13,279.73	Dec. 1, 1907
173	Expanded Metal and Corrugated Bar Co.	Steel bars.....	16.35	16.35	Feb. 15, 1908
178	John S. Penson.....	Canals and structures, division B-1, settling basin.	5,150.00	5,392.10	Sept. 15, 1907
213	Marquette Cement Manufacturing Co.	Cement.....	96.92	96.92	May 1, 1908

*Completed.

LANDS OPENED FOR IRRIGATION

On April 8, 1908, approved plats of 3 townships designating about 4,000 acres of land irrigable under the Buford-Trenton project, North Dakota, were forwarded to the Commissioner of the General Land Office with the following public notice:

PUBLIC NOTICE DATED APRIL 8, 1908

In pursuance of the provisions of section 4 of the reclamation act of June 17, 1902 (32 Stat. L., 388), notice is hereby given as follows:

Water will be furnished from the Buford-Trenton project, North Dakota, under the provisions of the reclamation act, in the irrigation season of 1908, for the irrigable land shown upon farm unit plats of T. 152 N., Rs. 103 and 104 W., and T. 153 N., R. 103 W., approved April 2, 1908, by the Secretary of the Interior, and on file in the local land office at Williston, N. Dak.

Homestead entries, accompanied by application for water rights and the first installment of the building and operation and maintenance charges, may be made under the provisions of said act for the farm units shown on said plats. Water-right applications may also be made for lands heretofore entered and for lands in private ownership, and the time when payments become due therefor is hereinafter stated.

The limit of area per entry, representing the acreage which in the opinion of the Secretary of the Interior may be reasonably required for the support of a family on the lands entered subject to the provisions of the reclamation act, is fixed at the amounts shown upon the plats for the several farm units.

The limit of area for which water-right application may be made for lands in private ownership shall be 160 acres of irrigable land for each landowner.

The charges which shall be made per acre of irrigable land in the said entries and for lands heretofore entered or in private ownership which can be irrigated by the waters from the said irrigation project are in two parts, as follows:

1. The building of the irrigation system, \$38 per acre of irrigable land, payable in not less than 5 nor more than 10 annual installments, each not less than \$3.80 per acre.

2. For operation and maintenance at the amounts stated below until further notice, divided as follows:

(a) A fixed charge for operation and maintenance of 70 cents per acre of irrigable land whether water is used or not; and

(b) An additional charge for operation and maintenance of 50 cents per acre-foot for water actually pumped and delivered for irrigation in any year.

The first installment on account of the said charges, for all irrigable lands entered hereafter, whether or not water is used thereon, shall be due and payable for the season of 1908, at the local land office at Williston, N. Dak., at the time of entry and filing water-right application, the total payment being not less than \$4.50 per acre for building the irrigation system and for the fixed charge for operation and maintenance. The additional charge for operation and maintenance of 50 cents per acre-foot of water furnished will be due and payable when the next installment of the building charge is due.

The installment for the second year shall be due and payable May 1, 1909, at the same place, and for subsequent years on or before May 1 of each year at the same time and place. For lands in private ownership or heretofore entered the first installment of the charges for building and the fixed charge for operation and maintenance, whether or not water-right application is made therefor or water is used thereon, shall be due and payable at the same place May 1, 1908. The additional charge for operation and maintenance of 50 cents per acre-foot of water furnished will be due and payable one year later.

For all applications for water rights for lands hereafter entered, filed after June 15 in any year, the building and operation and maintenance charges as herein provided shall be collected at the time of filing, but so much as may be paid on account of operation and maintenance shall be a credit on account of the installment for the next year.

The regulation is hereby established that no water will be furnished in any year until all operation and maintenance charges for preceding years have been paid, including the fixed charge and the charge for water furnished.

The charges herein provided for may, for the convenience of applicants, be paid to the special fiscal agent of the United States Reclamation Service for the project at his office, for transmission to the receiver of the local land office on or before the dates specified herein for payments at the local land office.

INSTRUCTIONS ACCOMPANYING PUBLIC NOTICE

The public notice of April 8, 1908, was accompanied by request that the local land officers be instructed to publish the notice once a week for four weeks in the Buford Tribune, and to announce that water-right applications must be filed in the proper form in the local land office before water can be furnished; that the United States will operate and maintain the pumping plant and the main canals as shown on a plat of the project approved by the director, a copy of which is on file in the office of the engineer in charge of the project, the cost thereof to be included in the operation and maintenance charges; that no water will be furnished in any year until the portion of the installment for operation and maintenance for prior years has been paid; that the amount of water to be furnished is 2-acre-feet

per acre per annum; that the building charge and number of annual installments are to be stated in the third paragraph of each application; and that the Secretary of the Interior has entered into a contract with the Buford-Trenton Water Users' Association and the certificate of the association forming a part thereof must be filled in before the application can be accepted.

SETTLEMENT

Of 4,049.64 acres opened by the public notice of April 8, 1908, 460.41 acres are in public ownership and 3,589.23 in private ownership. Two water-right applications covering 94 acres have been made for public lands, and four water-right applications covering 319.6 acres have been made for private lands.

OPERATION

Practically none of the farmers on the Buford bench have ever had experience with irrigation, and the necessity of having an experienced irrigation farmer was so strongly impressed upon the water users' association that on April 10, 1908, they secured the services of an expert to assist them in running out farm laterals and preparing and irrigating their land. The rainfall during May and June totaled 9 inches, and all crops were in fine condition, but irrigation will be required during the latter part of the season to complete the growth of the crops.

During May and the early part of June considerable difficulty was experienced by the irrigation expert in getting the farmers to prepare for irrigation by building the farm laterals required to distribute the water properly. With a very few exceptions, the farmers have failed to apply for water, only six applications having been received prior to June 30.

The pumping barge at Buford, which with the pumping machinery installed weighs 97 tons, was launched April 10, 1908. The 24-inch discharge pipes were connected with the settling basin, and on May 19 the first water was pumped. On May 26 water was pumped into the high-line canal. Owing to the rather favorable location, practically no trouble was experienced with drift logs and other debris during the June rise of the Missouri River, although this was the highest June rise of which there is an authentic record.

With the exception of three small crops of alfalfa, one field of corn, and a small potato patch, all crops under irrigation were confined to small grains. This similarity of crops will result in an excessive demand for water at one time.

The canal system has given no trouble, no breaks having occurred in the canal banks, and but very few changes have been required in the location of turnouts.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected water right building charges.....	\$1,571. 68		\$1,861. 20
Uncollected water right operation and maintenance charges.....	289. 52		
Inventories:			
Equipment in use.....	7,933. 85		
Storehouse.....	33. 64		
Cement.....	390. 65		
Iron and steel.....	417. 01		
Forage.....	137. 37		
Fuel.....	30. 00		
Unadjusted transfers.....		\$2,996. 83	
	8,942. 52	2,996. 83	5,945. 69
Cost of work:			
Building cost.....	183,938. 87		
Plus adjustments.....	661. 65		
Less accrued revenues.....		125. 00	
Less accrued repayments.....		1,571. 68	
	184,600. 52	1,696. 68	182,903. 84
Operation and maintenance cost.....	367. 85		
Less accrued repayments.....		289. 52	
	367. 85	289. 52	78. 33
Total.....			190,789. 06
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		1,738. 64	7,291. 86
Unpaid purchases.....		1,422. 88	
Unpaid contract holdbacks.....		453. 20	
Unpaid freight and express.....		3,638. 16	
Unpaid passenger fares.....		38. 98	
Investment of the United States:			
Disbursement vouchers.....		221,151. 11	
Collection vouchers.....	125. 06		
Transfer vouchers received.....		55,133. 99	
Transfer vouchers issued.....	92,662. 84		
	92,787. 90	276,285. 10	183,497. 20
Total.....			190,789. 06

Total cost to June 30, 1908, distributed to principal physical features

Transmission line (28.3 miles).....	\$21,402. 95
Barge pumping station and ways.....	29,148. 87
Settling basin and mattresses.....	6,645. 91
Secondary pumping station.....	31,660. 91
Concrete discharge pipe line.....	19,205. 05
High line canal and structures.....	22,694. 46
Six-mile flume.....	677. 22
Preliminary surveys.....	23,863. 41
Real estate (rights and property).....	935. 32
Buildings (offices, dormitories, warehouses, etc.).....	3,881. 46
Engineering expense as a whole.....	23,773. 13
Cost ledger inventories.....	50. 18

Total building cost as per debit in cost of work in statement of assets and liabilities..... 183,938. 87

NESSON PROJECT

GENERAL STATEMENT

The principal data relating to the Nesson project are summarized as follows:

Counties: Williams and McKenzie.
 Townships: 154 N., Rs. 95 to 97 W., fifth principal meridian.
 Irrigable area: 18,500 acres. Ownership, public, State, and school, 5,500 acres; private, 13,000 acres.
 Average elevation of irrigable area: 1,850 feet above sea level.
 Average annual rainfall on irrigable area: 15 inches.
 Range of temperature on irrigable area: Maximum, 107°; minimum, -59°.
 Character of soil of irrigable area: Sandy loam and sandy soil.
 Duty of water: 2 acre-feet per acre per annum.
 Size of farm units: 160 acres.
 Principal products: Wheat, flax, oats, alfalfa, vegetables, sugar beets, and small fruits.
 Railroad station: Ray, N. Dak.
 Railroad: Great Northern.
 Principal markets: St. Paul, Minneapolis, and Duluth, Minn.; and local towns.
 Source of water supply: Pumping from Missouri River.
 Main canals: Length, 20 miles.
 Laterals: Length, 30 miles.
 Power development: 2,500 horsepower with steam plant.
 Construction of project authorized: January 23, 1906.

A detailed description of the Nesson project will be found in the sixth annual report and general descriptions relating to the project are given in the second, third, fourth, and fifth annual reports. Briefly, the irrigation plan of this project contemplates the construction of a steam power plant on the south side of the Missouri River about 10 miles from Nesson, operating steam pumping units taking water from the Missouri River and delivering it into the south side canal system and generating electricity for transmission to the contemplated north side pumping system near Nesson. The north side pumping system will probably contain a floating barge pumping plant, taking water from the Missouri River and discharging it into a settling basin supplying a low-line canal, and a secondary pumping station, located on the basin, lifting water into a proposed high-line canal. No work other than surveys has been done on this project.

During the past year practically no additional stock subscriptions have been made in the Nesson Valley Water Users' Association, which leaves the affairs of the project in about the same condition as described in the sixth annual report.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Inventories:			
Unadjusted transfers.....	\$105.59		\$105.59
Cost of work:			
Building cost.....	16,931.23	}	17,005.90
Plus adjustments.....	74.67		
Total.....			17,111.49

Assets and liabilities on June 30, 1908—Continued

Items.	Debits.	Credits.	Amounts.
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		\$110.00	\$112.75
Unpaid freight and express.....		2.75	
Investment of the United States:			
Disbursement vouchers.....		7,002.76	
Collection vouchers.....	\$4.14		
Transfer vouchers received.....		29,774.81	
Transfer vouchers issued.....	19,774.69		
	19,778.83	36,777.57	16,998.74
Total.....			17,111.49

Total cost to June 30, 1908, distributed to principal physical features.

Preliminary examination and surveys..... \$16,931.23

WASHBURN PROJECT**GENERAL STATEMENT**

The principal data relating to the Washburn project are summarized as follows:

County: McLean.

Townships: 143 to 144 N., R. 81 W., fifth principal meridian.

Irrigable area: 5,000 acres.

Duty of water: 2 acre-feet per acre per annum.

Source of water supply: Pumping from Missouri River.

The irrigation plan of the Washburn project as now being investigated involves a high-line canal about 10 miles long for bench lands with a pumping lift from the Missouri River near Washburn of about 90 feet. Two difficult coulee crossings will be encountered on the canal line. For the bottom lands it appears possible to use Painted Woods Lake for storage and to pump from it into a low-line canal. An alternative plan being investigated involves the use of Painted Woods Lake for a sediment and storage basin filled by gravity flow from the Missouri River at high-water stages and by pumping from the river during normal and low-water stages. From Painted Woods Lake the water will then be lifted to the high line canal with an equalizing reservoir at the head of the pressure pipe. A low lift, as in the foregoing scheme, at the same point will cover the bottom lands. Another alternative plan under consideration is the lifting of water direct from the Missouri River to high-line canals heading at the lower end of the project and carrying the water up the valley to the irrigable lands. In the fall of 1907 the state engineer made a preliminary survey and prepared a map showing the irrigable area, and during the field season of 1908 surveys will be made by the Reclamation Service to locate the canals and pumping stations and to ascertain the approximate cost of the project. The lands to be irrigated comprise bottom lands lying at an elevation of about 15 feet above low water, bench lands adjacent to the bottom lands, and a small acreage of land in the valleys of Painted Woods Lake and Turtle Creek. A water users' association has been formed and about 8,800 acres of land on and in the vicinity of the project have been subscribed.

WILLISTON PROJECT

GENERAL STATEMENT

The principal data relating to the Williston project are summarized as follows:

County: Williams.

Townships: 153 to 155 N., Rs. 100 and 101 W., fifth principal meridian.

Irrigable area: 12,000 acres. Ownership, public, 1,000 acres; State and school lands, 200 acres; private, 10,800 acres.

Average elevation of irrigable area: 1,850 to 1,950 feet above sea level.

Average annual rainfall on irrigable area: 15 inches.

Range of temperature on irrigable area: Maximum 107°; minimum -50°.

Character of soil of irrigable area: Sandy loam, heavy clay, and sandy silt.

Duty of water: 2 acre-feet per acre per annum.

Size of farm units: 160 acres.

Principal products: Cereals, alfalfa, sugar beets, vegetables, and small fruits.

Railroad station: Williston, N. Dak.

Railroad: Great Northern.

Principal markets: St. Paul, Minneapolis, and Duluth, Minn.; and Chicago, Ill.

Source of water supply: Pumping from Missouri River.

Main canal: Length, 16 miles.

Laterals: Length, 32 miles.

Power development: 1,500 horsepower with steam plant for Williston project and 1,500 horsepower for Buford-Trenton project.

Construction of project authorized: January 23, 1908.

Per cent of project completed: 55.

A detailed description of the Williston project will be found in the fifth annual report and general descriptions relating to the project are given in the third, fourth, and sixth annual reports. Briefly, the irrigation plant of the present unit of this project involves the construction of a central steam-turbine power plant for generating electricity for operating a series of motor-driven centrifugal pumps installed on a barge in the Missouri River, a settling basin receiving water from the intake pumping station, a main canal extending from the settling basin up Little Muddy Creek past the power plant, one electrically driven pumping station taking water from the main canal, one steam-driven pumping station likewise taking water therefrom, one electrically driven pumping station taking water from a high-line canal supplied by the electrically driven pumping station on the main canal, and canal systems distributing water from these various pumping stations onto lands in the valley of Little Muddy Creek in the vicinity of Williston, N. Dak. One of the pumping stations on the main canal is situated about halfway between the intake station and the power plant. This station pumps water for a high-line canal covering lands on the west side of Little Muddy Creek and supplies water to the pumping station located on this canal, lifting water to a second high-line canal covering lands on the same side of the creek. Another of the pumping stations is located at the power plant and pumps water into a high-line canal from this point covering lands on the east side of Little Muddy Creek in the lower valley and on both sides thereof in the upper portion of the valley. The power plant is located at a lignite mine, from which a fuel supply is obtained, and the same power station also contains a steam-turbine electric-generating installation and transformers for the use of the Buford-Trenton project. Future possible developments of the project contemplate the extension of the present canal system and the installation of a second intake station and the construction of the

necessary subsidiary canals. At the present time a power house 90 feet square has been constructed, and in it the following machinery has been installed for the combined use of the Williston and Buford-Trenton projects: Six 250-horsepower Sterling boilers, with furnaces of the Dutch-oven type, equipped with rocking gates and forced-draft apparatus; three steel smokestacks 135 feet high and 54 inches in diameter; two horizontal steam-turbine generator units of 300-kilowatt capacity each, generating three-phase alternating-current electricity at 60 cycles and 2,200 volts; three water-cooled transformers of 250-kilowatt capacity each, changing the generator voltage from 2,200 to a line voltage of 22,000. In connection with the Williston project the following work has been completed: Four miles of transmission lines, the construction of the intake station, including the installation of three pumping units of 30-second-foot capacity, the construction of the pumping station on the main canal between the intake station and power plant, including the installation of two pumping units of 35-second-foot capacity, the construction of a station on the high-line canal including the installation of one pumping unit of 20-second-foot capacity, and the installation of two steam-driven turbine pumping units in the power station.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Williston project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
113	Illinois Steel Co.....	Cement.....	\$1,796.40	\$1,796.40	Apr. 1, 1907
123	D'Olier Engineering Co.....	Power and pumping system, schedules A, B, D, and E.	76,229.50	81,873.16	Oct. 5, 1907
131	General Electric Co.....	Power and pumping system, schedule C.	41,304.00	40,934.16	Dec. 5, 1907
132	John H. Donohue.....	Power and pumping system, schedule G.	13,836.00	15,042.61	Sept. 1, 1907
136	Henry C. De Laney.....	Canals and structures.....	81,867.00	84,413.39	Sept. 15, 1907
156	Universal Portland Cement Co.	Cement.....	4,837.50	4,837.50	Dec. 31, 1907
210	John A. Roebling's Sons Co.	Copper wire.....	8,464.10	8,464.10	Apr. 12, 1908
213	Marquette Cement Manufacturing Co.	Cement.....	103.46	103.46	May 1, 1908

* Completed.

LANDS OPENED FOR IRRIGATION

On April 27, 1908, approved plats of 3 townships designating about 8,000 acres of land irrigable under the Williston project, North Dakota, were forwarded to the Commissioner of the General Land Office with the following public notice:

PUBLIC NOTICE DATED APRIL 27, 1908

In pursuance of the provisions of section 4 of the reclamation act of June 17, 1902 (32 Stat. L., 388), notice is hereby given as follows:

Water will be furnished from the Williston project, North Dakota, under the provisions of the reclamation act, in the irrigation season of 1908, for the

irrigable land shown upon farm unit plats of T. 154 N., Rs. 100 and 101 W.; and T. 155 N., R. 100 W., approved April 24, 1908, by the Secretary of the Interior and on file in the local land office at Williston, N. Dak.

Homestead entries, accompanied by applications for water right and the first installment of the building and operation and maintenance charges, may be made under the provisions of the said act for the farm units shown on said plats. Water-right applications may also be made for lands heretofore entered and for lands in private ownership, and the time when payments become due therefor is hereinafter stated.

The limit of area per entry, representing the acreage which, in the opinion of the Secretary of the Interior, may be reasonably required for the support of a family on the lands entered subject to the provisions of the reclamation act, is fixed at the amounts shown upon the plats for the several farm units.

The limit of area for which water-right application may be made for lands in private ownership shall be 160 acres of irrigable land for each landowner.

The charges which shall be made per acre of irrigable land in the said entries and for lands heretofore entered or in private ownership which can be irrigated by the waters from the said irrigation project are in two parts, as follows:

1. The building of the irrigation system, \$38 per acre of irrigable land, payable in not less than 5 nor more than 10 annual installments, each not less than \$3.80 per acre.

2. For operation and maintenance at the amounts stated below until further notice, divided as follows:

- (a) A fixed charge for operation and maintenance of 70 cents per acre of irrigable land whether water is used or not; and

- (b) An additional charge for operation and maintenance of 50 cents per acre-foot for water actually pumped and delivered for irrigation in any year.

The first installment on account of the said charges for all irrigable lands entered hereafter, whether or not water is used thereon, shall be due and payable for the season of 1908 at the local land office at Williston, N. Dak., at the time of entry and filing water-right application, the total payment being not less than \$4.50 per acre for building the irrigation system and for the fixed charge for operation and maintenance. The additional charge for operation and maintenance of 50 cents per acre-foot of water furnished will be due and payable when the next installment of the building charge is due.

The installment for the second year shall be due and payable May 1, 1909, at the same place, and for subsequent years on or before May 1 of each year, at the same time and place. For lands in private ownership or heretofore entered the first installment of the charges for building and the fixed charge for operation and maintenance, whether or not water-right application is made therefor or water is used thereon, shall be due and payable at the same place May 1, 1908. The additional charge for operation and maintenance of 50 cents per acre-foot of water furnished will be due and payable one year later.

For all applications for water rights for lands hereafter entered, filed after June 15 in any year, the building and operation and maintenance charges as herein provided shall be collected at the time of filing, but so much as may be paid on account of operation and maintenance shall be a credit on account of the installment for the next year.

The regulation is hereby established that no water will be furnished in any year until all operation and maintenance charges for preceding years have been paid, including the fixed charge and the charge for water furnished.

The charges herein provided for may, for the convenience of applicants, be paid to the special fiscal agent of the United States Reclamation Service for the project at his office, for transmission to the receiver of the local land office on or before the dates specified herein for payments at the local land office.

INSTRUCTIONS ACCOMPANYING PUBLIC NOTICE

The public notice of April 27, 1908, was accompanied by directions that the local land officers be instructed to publish the notice once a week for four weeks in the Williston Graphic and the Williston Herald, and to announce that water-right applications must be filed in the proper form in the local land office before water can be fur-

nished; that the United States will operate and maintain the pumping plant and the main canals as shown on a plat of the project approved by the director, a copy of which is on file in the office of the engineer in charge of the project, the cost thereof to be included in the operation and maintenance charges; that no water will be furnished in any year until the portion of the installment for operation and maintenance for prior years has been paid; that the amount of the water to be furnished is 2 acre-feet per acre per annum; that the building charge and number of annual installments are to be stated in the third paragraph of each application; and that the Secretary of the Interior has entered into a contract with the Buford-Trenton Water Users' Association and the certificate of the association forming a part thereof must be filled in before the application can be accepted.

SETTLEMENT

Of the 8,033.31 acres of land opened by the public notice of April 27, 1908, 180 acres are in public ownership and 7,853.31 are in private ownership. No water-right applications have been made for the public lands, and 25 water-right applications, covering 2,170.39 acres, have been made for the private lands.

OPERATION

Preparations for resuming operations at the power plant were begun in March, 1908, the machinery having been idle since about November 1, 1907. The Williston pumping barge was launched May 6, 1908, and towed to position May 8.

Delivery of water into the canal system began May 11, and the several pumping stations had all begun operating on or before May 16.

The June rise of the Missouri River in 1908, continuing from the 5th to the 25th of the month, reached an abnormally high stage. During the most of this time the river was bringing down a large amount of logs, bridge timbers, piles, and other wreckage, which seriously endangered the pumping barge. For about five days, there being no demand for irrigation water, the discharge pipes from the pumps were disconnected and the barge moored to the bank for safety. On June 18 pumping operations for the purpose of testing the electric machinery and pumps, as required by the contracts prior to final acceptance, were begun and were continued for several days. It was planned to carry on these tests in connection with the delivery of a gradually increasing supply of water for irrigation. Had this been possible, the employees in the power plant and on the canal system would have had an opportunity to become gradually trained in their duties. Failure on the part of the water users to apply for water until after the tests were completed interfered with this plan, and the water pumped for priming canals and for testing machinery was practically all wasted. The first water-right application was made June 11, and the first request for delivery of water June 12. Water for irrigation purposes was first delivered June 23, although only three requests for delivery of water had then been received. Only seven more requests for delivery of water had been received be-

fore June 30, and therefore very little water had been pumped for irrigation before the end of the fiscal year.

The pumping machinery and canal system are designed on the basis of being able to deliver water under conditions of maximum demand at the rate of 1 cubic foot per second for each 80 acres of irrigable land included in the project; this would result in delivering 1 acre-foot of water per acre over the entire irrigable area in forty days. The estimated amount of water required during an irrigation season, namely, 2 acre-feet per acre, represents the total possible output of the pumps and the carrying capacity of the main canals during eighty days' continuous running. It is not anticipated, however, that the irrigation season will be confined to eighty days' operation at the full capacity of the system. On the other hand, it is expected that the irrigating season will extend from about May 20 to September 20. During these four months of operation it is probable that the full output of the pumping system will not be required continuously for longer than about six weeks at the height of the season, during which period about 1 acre-foot per acre for the entire irrigable acreage would be delivered. Consequently, it will be necessary for the farmers to select and diversify their crops and to apply for and use the irrigation water at the rate for which the plant was designed. However, even under the condition of undiversified crops, fair results might be attained by beginning the application of water early in the season before crops begin to suffer.

The failure to take water earlier this season was doubtless due to the farmers' lack of experience in irrigation. Hardly a man on the project had lived in an irrigated region. The expert irrigation farmer, hired by the water users' association to assist the water users in preparing their farms for irrigation, arrived in March and exerted himself faithfully to get farm laterals built in time to utilize the water as soon as available. Owing, however, to the apathy of the landowners and to the inclemency of the weather during April and May, as well as to the difficult topography of the lands, the laterals built were few and temporary. The showers during May and early June gave all grain an excellent start and rapid growth, which induced most of the farmers to hope that they would not require any irrigating water this year. For this reason applications for water were not made until crops were already suffering.

The total amount of water pumped from the Missouri River prior to July 1 is estimated to be 1,706 acre-feet, the amount delivered on requests for irrigation being only 138 acre-feet and the balance being wasted, principally during the period of priming canals and testing machinery. Of about 1,500 acres to be irrigated this year, only 127 acres are planted in alfalfa, 25 acres in potatoes, and 10 acres in corn. Probably 85 per cent of the rest is planted in wheat, oats, and flax, and the remainder in native hay.

COAL MINING

The output of the lignite mine was 360 short tons for May and 754 for June. It was anticipated at the beginning of the season from the quality of lignite previously found in test shafts that the main entries would soon encounter a better grade of lignite. The lignite

vein being worked and the material on top of it are so weak that pillars at least 50 feet square must be allowed to remain between and on each side of the main entries. Had stronger lignite been encountered early in the spring, as was expected, it would have been possible to open rooms 14 or more feet in width, as is done in other mines in the vicinity. This would have decreased the cost of mining and increased the possible output. Room work has not been possible anywhere in the present entries. All mining this year has been done in entries 7 feet wide and 7 feet high, requiring constant and careful timbering. The roof has usually been so weak that cave-ins would result if the working face was carried more than 6 feet ahead of the timbering.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected water right building charges.....	\$3,247.48		\$9,766.75
Uncollected water right operation and maintenance charges.....	1,519.27		
Inventories:			
Equipment in use.....	12,322.82		16,621.65
Storehouse.....	106.36		
Cement.....	390.50		
Iron and steel.....	897.39		
Forage.....	525.42		
Local products.....	220.51		
Unadjusted transfers.....	2,158.65		
Cost of work:			
Building cost.....	379,525.12		
Plus adjustments.....	27,175.90		
Less accrued repayments.....		\$3,247.48	
	406,701.02	8,247.48	398,453.54
Operation and maintenance cost.....	1,765.28		
Less accrued repayments.....		1,519.27	
	1,765.28	1,519.27	246.01
Total.....			425,087.95
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		4,124.47	43,803.47
Unpaid purchases.....		2,493.89	
Unpaid contract estimates.....		5,412.92	
Unpaid contract holdbacks.....		29,824.94	
Unpaid freight and express.....		1,953.25	
Unpaid passenger fares.....		4.00	
Investment of the United States:			
Disbursement vouchers.....		345,242.61	
Collection vouchers.....	387.03		
Transfer vouchers received.....		68,589.00	
Transfer vouchers issued.....	32,100.10		
	32,547.13	413,831.61	381,284.48
Total.....			425,087.95

Total cost to June 30, 1908, distributed to principal physical features

Coal mine construction.....	\$11,344.66
Power plant:	
Power house and pumping station No. 1.....	121,819.93
Transmission line.....	9,297.29
Transformer barge.....	3,230.78

Power plant—Continued.

Pumping station at barge-----	\$35,460.88
Pumping station No. 2-----	11,599.21
Pumping station No. 4-----	6,756.16
Distributing system, earthwork and structures-----	110,265.42
Buildings:	
Offices, dormitories, warehouses, etc-----	7,017.70
Maintenance of camps-----	1,097.46
Real estate (rights and property)-----	2,522.82
Irrigable lands:	
Farm unit subdivision soil examination-----	136.96
Topographic surveys-----	6,770.30
Examination of project as a whole-----	19,879.08
Administration of project as a whole-----	32,326.47

Total building cost as per debit in cost of work in statement of assets and liabilities-----	379,525.12
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NORTH DAKOTA—SOUTH DAKOTA

BOWMAN PROJECT

GENERAL STATEMENT

The Bowman project lies in the narrow valley of the North Fork of Grand River in the southern part of North Dakota and the northwestern part of South Dakota. The irrigation plan of the project contemplates the storage of the waters of the North Fork of Grand River by means of an earth dam on the river near the eastern boundary of T. 129 N., R. 100 W., fifth principal meridian, and the distribution thereof by means of two canals diverting water from the river at the dam site, one on each side thereof, covering irrigable lands extending from the dam site to a distance about 10 miles below the dam on the south side and about 18 miles below on the north side of the river. The total irrigable area is about 10,000 acres.

It is proposed to take up at an early date preliminary surveys on the project covering the reservoir and dam sites and the canal locations, and also to begin the preparation of property and soil maps.

FINANCIAL STATUS AND FEATURE COSTS

Assets and Liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Cost of work, building cost.....	\$3. 20		\$3. 20
LIABILITIES.			
Investment of the United States, disbursement vouchers.....		\$3. 20	\$3. 20

Total cost to June 30, 1908, distributed to principal physical features

Preliminary expense..... \$3. 20

OKLAHOMA
CIMARRON PROJECT
GENERAL STATEMENT

The principal data relating to the Cimarron project are summarized as follows:

Counties: Beaver and Woodward.

Townships: 5 and 6 N., R. 28 E.; 28 and 29 N., Rs. 24 to 26 W.

Irrigable area: 10,000 to 14,000 acres, all in private ownership.

Average elevation of irrigable area: 1,950 feet above sea level.

Range of temperature on irrigable area: Maximum, 110°; minimum, 20°.

Character of soil of irrigable area: Clay loam, sandy loam, sandy clay.

Duty of water: 2 acre-feet per acre per annum.

Principal products: Wheat, alfalfa, broom corn, and cotton.

Railroad station: Englewood, Kans.

Railroad: Atchison, Topeka and Santa Fe.

Principal markets: Wichita, Kans., and Kansas City, Mo.

General descriptions relating to features of the Cimarron project are given in all of the previous annual reports. A proposed irrigation plan of the project contemplates the construction of a central power plant for generating electricity for operating several pumping stations receiving water supply from underground flow in the Cimarron River Valley near Englewood, Kans., for supplementing the low water flow of the river for existing and contemplated canals. Other plans for the project contemplate the construction of storage reservoirs on the headwaters of the Cimarron River for supplementing its low water flow for existing canals and various contemplated canals.

Studies of the underflow possibilities of the Cimarron River were continued during the past year. It appears that the conditions as at present known will not justify the establishment of pumping plants on a large scale. There are localities where small private plants can operate profitably. The storage possibilities of the Cimarron Valley are limited. Where possible reservoir sites exist the conditions governing the construction of dams are unfavorable.

On account of the opportune rainfall of the last few years the need for irrigation has not been keenly felt in western Oklahoma, and landowners have not been willing to incur the expense of reservoirs. The year 1908 has been drier than usual and a revival of interest in irrigation is apparent in this section. The lands on the project are of great fertility and convenient to the best markets in the United States, and it appears probable that when the landowners realize the possibilities of irrigation development they will be desirous of having the project built.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Inventories, storehouse.....	\$486.31		\$486.31
Cost of work:			
Building cost.....	4,609.56		5,613.10
Plus adjustments.....	1,003.54		
Total.....			6,099.41
LIABILITIES.			
Accounts payable:			
Unpaid freight and express.....		\$41.74	41.74
Investment of the United States:			
Disbursement vouchers.....		5,895.49	
Transfer vouchers received.....		188.73	
Transfer vouchers issued.....	26.55		
	26.55	6,084.22	6,057.67
Total.....			6,099.41

Total cost to June 30, 1908, distributed to principal physical features

Preliminary examination and surveys..... \$4,609.56

RED RIVER PROJECT

A general description of the Red River project will be found in the second annual report. The expenditures on this project for the fiscal year have been for services, freight, supplies, and gaging streams, amounting to \$2,277.90, making a total expenditure to June 30, 1908, of \$60,022.90, of which \$2,913.09 represent the value of the inventory on hand.

OREGON
CENTRAL OREGON PROJECTS

GENERAL STATEMENT

A detailed description of the Central Oregon projects will be found in the third annual report. These projects consist of Silver Creek, Chewancan, Ana River, and Crescent Lake projects, all situated in central Oregon. The irrigation plan of the Silver Lake project is not yet determined, but the scheme under investigation proposes the storage of water on Silver Creek for irrigating lands lying to the west of the creek and the utilization of Silver Lake for irrigating lands lying north of the lake. The irrigation plan of the Chewancan project involves the construction of a storage reservoir on the upper course of the Chewancan River by means of a dam across the river, a diversion dam on the river near Paisley, and a canal diverting water from the left end of the dam and covering about 33,000 acres of lands lying north of Paisley and north and east of the Chewancan Marsh. The irrigation plan of the Ana River project involves the construction of a high diversion dam on Ana River and a canal system covering about 15,000 acres of land around Sumner Lake. The irrigation plan of Crescent Lake project contemplates the storage of the water of Odell and Crescent lakes and of that of the East Fork of Deschutes River and its diversion across the Walker Mountains on to the Silver Lake Desert. No work other than preliminary examinations and surveys has yet been done on these projects.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Cost of work, building cost.....	\$22,707. 41		\$22,707. 41
LIABILITIES.			
Investment of the United States:			
Disbursement vouchers.....		\$23, 131. 14	
Collection vouchers.....	423. 73		
	423. 73	23, 131. 14	22,707. 41
Total.....			22,707. 41

Total cost to June 30, 1908, distributed to principal physical features

Preliminary examination and surveys..... \$22,707. 41

MALHEUR PROJECT

A general description of the Malheur project will be found in the third annual report. The expenditures on this project for the fiscal year have been for services, amounting to \$85.35, making a total expenditure to June 30, 1908, of \$71,072.56.

UMATILLA PROJECT

GENERAL STATEMENT

The principal data relating to the Umatilla project are summarized as follows:

County: Umatilla.

Townships: 4 and 5 N., Rs. 28 and 29 E., W. M.

Irrigable area: 20,440 acres. Ownership, public, 3,740 acres; railroad, 900 acres; private, 15,800 acres.

Average elevation of irrigable area: 470 feet above sea level.

Average annual rainfall on irrigable area: 9 inches.

Range of temperature on irrigable area: Maximum, 115°; minimum, -10°.

Character of soil of irrigable area: Sandy soil and volcanic ash.

Duty of water: 2.8 acre-feet per acre per annum.

Size of farm units: 10 to 40 acres.

Principal products: Grain, hay, vegetables, and fruit.

Railroad station: Hermiston, Oreg.

Railroads: Oregon Railroad and Navigation Company and Northern Pacific.

Principal markets: Portland, Oreg., and Spokane, Wash.

Watershed area: 1,610 square miles.

Average annual rainfall on watershed: 20 inches.

Estimated annual run-off of watershed: 600,000 acre-feet.

Reservoir: Area, 1,500 acres; capacity, 50,000 acre-feet.

Storage dam: Type, earth fill, height, 98 feet; length, 3,500 feet.

Diversion dam: Type, concrete weir; height, 2.5 feet; length, 400 feet.

Dike: Length, 700 feet.

Main canals: Length, 33 miles.

Laterals: Length, 108½ miles.

Construction of project authorized: December 4, 1905.

Per cent of project completed: 78.

A detailed description of the Umatilla project will be found in the fifth annual report and general descriptions relating to the project are given in the second, third, fourth, and sixth annual reports. Briefly, the irrigation plan of this project involves the construction of a diversion dam on the Umatilla River at a point about 2 miles above Echo, Oreg., a storage reservoir on a small tributary of the Columbia River controlled by the Cold Springs dam, an inlet canal connecting the diversion dam with the storage reservoir, an outlet canal from the storage reservoir covering lands in the Umatilla and Columbia River valleys near Hermiston, a by-pass canal connecting the inlet canal with the outlet canal for passing the diverted water directly from the inlet canal into the distributing system without going through the reservoir, and a distributing system. The diversion dam, the inlet canal, the Cold Springs dam, and a portion of the distributing system are completed and a large portion of the distributing system is under construction.

STORAGE FEED CANAL

The contract for the construction of the storage feed canal was completed in August, 1907. The priming of the canal was begun the same month. The first water entered the distribution system in

December, 1907, and the first water entered the reservoir in February, 1908. The canal was in operation until June 26, 1908, when it was shut down on account of insufficient water in the river. During the season, prior to June 30, 25,000 acre-feet of water entered the canal, of which 19,700 acre-feet reached the reservoir and 600 acre-feet were discharged directly into the distribution system.

Between Echo and Fosters, where the main line of the Oregon Railroad and Navigation Company is below and close to the canal, seepage from the latter has threatened the stability of the railroad bed; consequently it has been decided to line with concrete not less than one-half mile of the canal.

COLD SPRINGS DAM

The work of constructing the Cold Springs dam was pushed vigorously throughout the year 1907 and until the middle of June, 1908, when the dam was completed. Building the dam involved as principal items: The excavation of 757,000 cubic yards of earth and gravel and 4,000 cubic yards of rock and the placing of 32,500 cubic yards of rock fill and 3,900 cubic yards of concrete.

DISTRIBUTION SYSTEM

On October 31, 1907, proposals were opened for an extension of the lateral system, the work being divided into small sections, aggregating 70,000 cubic yards of earth excavation. Contract was awarded for the work.

Lines of reinforced concrete pipe, aggregating about 8,000 feet in length, have been laid and are now giving satisfactory service.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ended June 30, 1908:

Principal contracts, Umatilla project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
71	Pacific Portland Cement Co.	Cement.	\$1,581.00	\$1,581.00	.....
94	do	do	5,442.00	4,884.00	July 1, 1907
118	Puget Sound Building and Dredging Co.	Storage feed canal.	161,388.50	202,127.92	Aug. 31, 1907
140	Pacific Portland Cement Co.	Cement.	15,141.25	15,141.25	June 1, 1908

LANDS OPENED FOR IRRIGATION

On December 27, 1907, approved plats of 4 townships designating 6,638 acres of land irrigable under the Umatilla project, Oregon, were forwarded to the Commissioner of the General Land Office with the following public notice:

PUBLIC NOTICE DATED DECEMBER 27, 1907

In pursuance of the provisions of section 4 of the reclamation act of June 17, 1902 (32 Stat. L., 388), notice is hereby given as follows:

Water will be furnished from the Umatilla project in Oregon under the provisions of the reclamation act in the irrigation season of 1908, for the irrigable land shown upon farm unit plats of Tps. 4 and 5 N., R. 28 E., and Tps. 4 and 5 N., R. 29 E., W. M., approved December 23, 1907, by the Secretary of the Interior and on file in the local land office at La Grande, Oreg.

That homestead entries accompanied by applications for water right may be made under the provisions of the said act for the farm units shown on said plats.

The limit of area per entry representing the acreage which, in the opinion of the Secretary of the Interior, may be reasonably required for the support of a family on the lands in question, is fixed, for lands entered subject to the provisions of the reclamation act, at the amounts shown upon the plats for the several farm units.

The limit for which water-right application may be made for lands in private ownership shall be 160 acres of irrigable land for each land owner.

The charges which shall be made per acre of irrigable land in the said entries and for lands in private ownership which can be irrigated by the waters from the said irrigation project are in two parts, as follows:

1. The building of the irrigation system, \$60 per acre, of irrigable land, payable in not less than 5 nor more than 10 annual installments, each not less than \$6 per acre.

2. For operation and maintenance, which will, as soon as the data are available, be fixed in proportion to the amount of water used, with a minimum charge per irrigable acre whether water is used thereon or not. The operation and maintenance charges for the irrigation season of 1908 and until further notice will be \$1 per acre of irrigable land whether water is used thereon or not.

The first payment on account of said charges for all irrigable areas shown on these plats, whether or not water-right application is made therefor or water is used thereon, shall be due and payable at the local land office at La Grande, Oreg., on or before March 1, 1908, the total payment being not less than \$7 per acre.

The building charge for subsequent years shall be due and payable at the same place on or before March 1 of each year, and until further notice the operation and maintenance charge of \$1 per acre of irrigable land per annum shall be due and payable at the same time and place.

For all applications for water rights filed after June 15 in any year, the building, operation and maintenance charges shall be collected at the time of filing for that irrigation season; but so much as may be paid on account of operation and maintenance shall be a credit on account of the installment for the next year.

The charges herein provided for may for the convenience of applicants be paid to the special fiscal agent of the United States Reclamation Service at Hermiston, Oreg., for transmission to the receiver of the United States land office at La Grande, Oreg., on or before the dates specified herein for payments at the local land office.

INSTRUCTIONS ACCOMPANYING PUBLIC NOTICE

The public notice of December 27, 1907, was accompanied by directions that the local land officers be instructed to give publicity to the notice and to announce that water-right applications must be filed in the proper form in the local land office before water can be furnished; that the United States will maintain and operate the storage and diversion dams, and main headworks, the main canal and main laterals, as shown on a plat of the project approved by the Director of the Reclamation Service, a copy of which is on file in the office of the engineer in charge of the project, the cost thereof to be included in the operation and maintenance charges; that the amount

of water to be furnished is 2.8 acre-feet per acre per annum; that the building charge and number of annual installments are to be stated in the third paragraph of each application; and that the Secretary of the Interior has entered into a contract with the Umatilla Water Users' Association, and the certificate of that association forming part of the water-right application must be filled in before the application can be accepted.

ORDER DATED AUGUST 3, 1908

The public notice issued December 27, 1907, of lands irrigable under the Umatilla project, Oregon, constructed in pursuance of the reclamation act of June 17, 1902 (32 Stat. L., 388), is hereby modified as follows in so far as the said notice relates to the time when installments shall be due and payable, namely:

The first payment on account of the charges for all irrigable areas shown on the plats, whether or not water-right application is made therefor or water is used thereon, shall be due and payable at the local land office at La Grande, Oreg., on or before December 1, 1908, the total payment, building and operation and maintenance, being not less than \$7 per acre.

The installments of the building charge, \$6 per acre, for subsequent years shall be due and payable at the same place on or before December 1 of each year, and until further notice the operation and maintenance charge of \$1 per acre of irrigable land shall be due and payable at the same time and place.

No water will be furnished to lands in any irrigation season unless all parts of installments for operation and maintenance for preceding years have been paid.

The terms of the public notice of December 27, 1907, are to remain in full force and effect except as modified by this order.

SETTLEMENT

Of the 6,638 acres opened by the public notice of December 27, 1907, 3,487 acres are in public ownership and 3,151 in private ownership. Thirteen water-right applications covering 192 acres have been made for public lands, and 83 water-right applications covering 3,656.26 acres have been made for private lands. The excess of land in private ownership for which water-right applications have been made over the total area in private ownership is due to relinquishments. The land in the Hermiston unit for which water-right applications have not been filed is held in private ownership, mainly by one company. This company is under contract with the United States to sell its holdings, within one year from the date of the secretary's notice, to purchasers capable of perfecting water rights.

OPERATION

On March 8, 1908, water was turned into the distribution system for the purpose of priming the canals. The first water for irrigation was turned on the land March 25. Service has since that date been regularly maintained, except in certain sections at times during and just after each of the more violent dust storms. Thirty miles of canals and main laterals are now in use, through which 6,500 acre-feet of water have passed.

CROP CONDITIONS

Unusually high winds prevailed during this spring and lasted until late into June, greatly interfering with farm operations. The land has been planted mainly to alfalfa, fruit trees, and vegetables. On account of the cold spring and prolonged and violent wind storms, the results have not been all that could be desired; however, the favorable showing made in the growth of certain varieties of fruit trees and vines under the unusual and extremely adverse weather conditions indicates that a successful fruit-growing industry may ultimately be developed on the project.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected miscellaneous.....	\$583. 80		\$27, 178. 62
Uncollected water right building charges.....	22, 795. 56		
Uncollected water right operation and maintenance charges.....	3, 799. 26		
Inventories:			
Mercantile stores.....	2, 149. 91		105, 583. 76
Equipment in use.....	95, 529. 35		
Storehouse.....	208. 14		
Cement.....	2, 922. 66		
Iron and steel.....	2, 258. 93		
Lumber.....	887. 11		
Explosives.....	74. 89		
Forage.....	861. 97		
Fuel.....	602. 25		
Local products.....	88. 55		
Cost of work:			
Building cost.....	882, 041. 86		
Plus adjustments.....	12, 432. 62		
Less accrued revenues.....		\$1, 625. 91	
Less accrued repayments.....		23, 095. 56	
	894, 474. 48	24, 721. 47	869, 753. 01
Operation and maintenance cost.....	8, 593. 98		
Less accrued revenues.....		322. 00	
Less accrued repayments.....		3, 849. 26	
	8, 593. 98	4, 171. 26	4, 422. 72
Total.....			1, 006, 938. 11
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		5, 292. 77	
Unpaid purchases.....		9, 059. 93	
Unpaid freight and express.....		47, 363. 54	
Unpaid passenger fares.....		151. 73	
Unredeemed coupon books.....	30. 95		
Unpaid miscellaneous.....		26. 50	61, 863. 52
	30. 95	61, 894. 47	
Investment of the United States:			
Disbursement vouchers.....		933, 193. 56	945, 074. 59
Collection vouchers.....	6, 207. 56		
Transfer vouchers received.....		20, 192. 97	
Transfer vouchers issued.....	2, 104. 38		
	8, 311. 94	953, 386. 53	
Total.....			1, 006, 938. 11

Total cost to June 30, 1908, distributed to principal physical features

Storage feed canal, earthwork and structures.....	\$257, 271. 05
Cold Springs dam and reservoir:	
Land submerged.....	14, 068. 71
Embankments—	
Gravel (590,000 cubic yards).....	210, 904. 66
Earth (167,438 cubic yards).....	41, 866. 92
Rock fill (32,494 cubic yards).....	43, 699. 10
Excavation, classes 1, 2, and 3 (44,854 cubic yards).....	27, 570. 83
Main spillway (concrete).....	31, 716. 58
Miscellaneous concrete structures.....	24, 533. 79
Engineering expense.....	4, 842. 00
Inlet works—	
Feed canal chute.....	12, 376. 84
Inlet gates.....	1, 879. 93
Riprap.....	227. 50
Concrete steps.....	179. 01
Outlet works—	
Bridges and gates, outlet tower.....	5, 808. 37
Distributing system:	
Earthwork.....	55, 967. 89
Pipe lines.....	41, 857. 89
Concrete and wooden structures.....	24, 924. 88
Drainage and priming canals.....	3, 789. 88
Bridges.....	1, 121. 91
Engineering and superintendence.....	17, 288. 82
West branch canal.....	24, 272. 94
Buildings (offices, dormitories, warehouses, etc.).....	21, 250. 59
Cost ledger inventories.....	14, 621. 77
<hr/>	
Total building cost as per debit in cost of work in state- ment of assets and liabilities.....	882, 041. 86

SOUTH DAKOTA

BELLE FOURCHE PROJECT

GENERAL STATEMENT

The principal data relating to the Belle Fourche project are summarized as follows:

Counties: Butte and Meade.
Townships: 6 to 10 N., R. 3 to 8 E., B. H. M.
Irrigable area, 100,000 acres. Ownership, public, 50,000 acres; State, 5,000 acres; private, 45,000 acres.
Average elevation of irrigable area: 2,600 to 3,000 feet above sea level.
Average annual rainfall on irrigable area: 15 inches.
Range of temperature on irrigable area: Maximum, 100°; minimum, -25°.
Character of soil of irrigable area: Clay loam and sandy loam.
Duty of water: 2 acre-feet per acre per annum at the storage reservoir.
Size of farm units: 80 acres.
Principal products: Alfalfa, hay, grain, sugar beets, vegetables, and hardy fruits.
Railroad stations: Belle Fourche, Sturgis, and Whitewood, S. Dak.
Railroads: Chicago and Northwestern; Chicago, Burlington and Quincy; Chicago, Milwaukee and St. Paul.
Principal markets: Minneapolis and St. Paul, Minn.; Omaha, Nebr.; Sioux City, Iowa; Chicago, Ill.; Deadwood and other Black Hills towns, S. Dak.
Watershed area: 4,300 square miles.
Average annual rainfall on watershed: 20 to 25 inches.
Estimated annual run-off of watershed: 400,000 acre-feet.
Reservoir: Area, 8,010 acres; capacity, 207,770 acre-feet.
Storage dam: Type, earthen embankment with concrete water slope; height, 115 feet; top length, 6,200 feet.
Diversion dam: Type, concrete weir; height, 23 feet; length, 400 feet.
Main canals: Length, 100 miles.
Laterals: Length, 125 miles.
Construction of project authorized: May 10, 1904.
Per cent of project completed: 52.5.

A detailed description of the Belle Fourche project will be found in the fourth annual report, and general descriptions relating to the project are given in the second, third, fifth, and sixth annual reports. Briefly, the irrigation plan of this project involves the construction of a diversion dam on the Belle Fourche River at a point about 2 miles below Belle Fourche, S. Dak., a short inlet canal connecting the diversion works with a storage reservoir, and the construction on Owl Creek, a small tributary of the Belle Fourche River, of the storage reservoir controlled by the Belle Fourche dam, an outlet canal from the storage reservoir covering lands on the north side of Belle Fourche River, another outlet canal from the storage reservoir covering some lands on the north side of Belle Fourche River thence crossing the Belle Fourche River through an inverted siphon and covering lands on the south side of the river. The diversion dam, the inlet canal, and a portion of the outlet canal for the north side lands are completed. The Belle Fourche dam and the south side canal are under construction.

BELLE FOURCHE DAM

The Belle Fourche dam being built across Owl Creek 12 miles northeast of the town of Belle Fourche, was about 13.5 per cent completed at the beginning of the fiscal year and about 30 per cent completed at the close thereof. During the year there were about 331,500 cubic yards of material placed in the embankment. Progress on the dam has been slow, owing to the suspension of work from December 29, 1907, to April 21, 1908, due to the failure of the contractors. The work for the year on this structure has been mainly concentrated on the building of the embankment and on preparations for doing concrete work. Since the failure of the contractors, the work is being conducted by their sureties.

NORTH CANAL

The excavation of the first section of the north canal has been completed, but the two main structures, the Indian Creek and Horse Creek pressure pipes, are still to be constructed. This section of the canal is about $8\frac{1}{2}$ miles long. A second section of the canal will be built during 1909.

SOUTH CANAL

The excavation of about 40 of the 45 miles of south canal has been completed, and the canal will be ready for use as soon as the structures, some of which are now under construction, are built.

BELLE FOURCHE RIVER SIPHON

The Belle Fourche River siphon carrying south canal under Belle Fourche River is about half completed. This siphon is 5 feet in diameter and 3,600 feet long, and is being built with an 8-inch shell of concrete, strongly reenforced with steel. The difference between the water levels at the inlet and outlet of the siphon is 35 feet.

BELLE FOURCHE TUNNEL

At a point along the line of the south canal on the south side of the river a high bluff is encountered that requires a tunnel to carry the water to the valley beyond. This tunnel is nearly completed and consists of a bore 1,310 feet long and $9\frac{1}{2}$ feet wide by $10\frac{1}{2}$ feet high, through black shale. The cross section has a horseshoe shape and is lined with concrete from 6 to 10 inches in thickness.

ANDERSON DRAW SIPHON

Work on the Anderson draw siphon, carrying south canal across Anderson draw, a deep, rough gulch, has been initiated. The barrel of this siphon has an inside diameter of 7 feet and a shell of reenforced concrete 8 inches in thickness and is 503 feet long.

WHITEWOOD SIPHON

The construction of Whitewood siphon, carrying south canal across Whitewood Creek, has been started. The barrel of this siphon is 350 feet long and has an inside diameter of 8 feet and a shell of reinforced concrete 8 inches in thickness. Whitewood Creek carries the tailings from the Homestake Mine at Lead City, S. Dak., and is heavily impregnated with chemicals that kill all vegetation. Therefore it is necessary to keep the water of the creek out of the canal, and as the tailings have filled up the creek and are each year raising the water level a flume or grade crossing was not feasible. The excavation for this structure to the old creek bed is through 10 to 15 feet of wet mud and has been exceedingly difficult.

LATERAL SYSTEM

The lateral system is being continuously extended as the main canals are completed. This work requires many miles of small ditches and innumerable small structures consisting of turn-outs, weirs, drops, and division boxes. The laterals taking water from inlet canal and from south canal north of Belle Fourche River were completed during May, 1908, and are all in use, while a portion of those taking water from north canal are being completed so as to be ready for use when the dam is completed to a sufficient height to permit the storage of water in the Belle Fourche reservoir.

EXPERIMENT FARM

The northeast quarter of section 24, township 9 north, range 5 east, has been set apart for an experimental farm under the direction of the Department of Agriculture. A 10-room farmhouse and suitable barns and outbuildings have been built, the farm has been equipped with horses and machinery and the first crop was planted this year. Although there is no water ready yet, valuable demonstrations have been made to the farmers concerning crops best adapted to dry-land culture.

TELEPHONE SYSTEM

The telephone system has been extended during the past year from Orman to Vale by way of the Belle Fourche tunnel and Belle Fourche River siphon and all construction camps are connected therewith. A separate wire is being strung for the use of the operating force and will soon be connected with phones in the ditch riders' houses and at important structures. There are 34 miles of telephone lines in operation on the project with twelve phones in use.

TOWN SITES

Land has been withdrawn for one town site and two village sites on the project, but they will not be platted until water is ready for the land around them.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Belle Fourche project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
36	S. R. H. Robinson.....	Diversion dam and structures.	\$99,936.50	\$131,490.60	Sept. 16, 1907
73	Orman & Crook.....	Dam and canals.....	1,003,299.25	\$35,111.91	Sept. 1, 1908
90	Western Portland Cement Co.	Cement.....	72,900.00	62,613.81	Jan. 1, 1908
179	Cole Bros.....	Lateral ditches, section 7, Indian Creek lateral, earthwork.	12,700.00	\$12,373.00	July 1, 1908
183	General Fireproofing Co..	Steel.....	14,200.22	\$7,383.15	Oct. 12, 1907
186	J. W. McNeel.....	Lateral ditches, sections 8 to 11, earthwork.	53,007.50	\$42,447.99	July 1, 1908
190	J. E. Hilton.....	South canal, sections 7 and 8, earthwork.	46,000.00	\$37,326.63	Do.
192	Walter S. Dickey.....	Vitrified pipe.....	6,851.73	6,161.95	Mar. 1, 1908
192	George A. Lane.....	Lateral ditches, section 3, earthwork.	7,000.00	\$7,246.86	Jan. 1, 1908
195	H. T. Adams.....	Lateral ditches, section 2, earthwork.	15,287.50	\$13,692.24	Apr. 1, 1908
199	Pittsburgh Manufacturing Co.	Gates.....	1,817.34	\$1,940.84	Nov. 1, 1907
203	James O. Cason.....	Lateral ditches, section 5, earthwork.	1,547.50	\$1,047.00	July 1, 1908
204	Harley L. Shevling.....	Lateral ditches, part of section 1, earthwork.	8,795.00	\$7,302.85	Jan. 1, 1908
205	Primus & Wilson.....	Lateral ditches, part of section 1 and all of section 4, earthwork.	11,340.00	\$9,530.13	Apr. 1, 1908
207	DeVore Bros. & Farlow...	South canal, sections 5 and 6, earthwork.	57,600.00	\$40,116.83	Dec. 1, 1908
227	Western Portland Cement Co.	Cement.....	26,160.00	3,034.56	Oct. 1, 1908
232	J. E. Hilton.....	South canal, sections 4a, 4b, and 4c.	28,201.50	12,323.50	Mar. 1, 1909
234	National Surety Co.....	Dam and canals.....	693,187.34	48,703.88	Dec. 1, 1910
236	J. W. McNeel.....	South canal, section 2b.....	9,890.00	3,436.80	Mar. 1, 1909
238	Leonard Seitz.....	South canal, section 2a.....	8,062.00	1,723.80	Do.

* Includes extra work not covered by original contract.

• Suspended January 22, 1908. ° Completed.

LANDS OPENED FOR IRRIGATION

On June 21, 1907, approved plats of six townships designating about 12,023 acres of land irrigable under the Belle Fourche project, South Dakota, were forwarded to the Commissioner of the General Land Office with the following public notice:

PUBLIC NOTICE DATED JUNE 21, 1907

In pursuance of the provisions of section 4 of the reclamation act of June 17, 1902 (32 Stat. L., 388), notice is hereby given that water will be furnished from the Belle Fourche project in South Dakota under the provisions of the reclamation act, at the opening of the irrigation season of 1908 for the irrigable lands shown upon farm unit plats of T. 9 N., R. 3 E., B. H. M.; T. 9 N., R. 4 E., B. H. M.; T. 9 N., R. 5 E., B. H. M.; T. 8 N., R. 3 E., B. H. M.; T. 8 N., R. 4 E., B. H. M.; T. 8 N., R. 5 E., B. H. M.; approved by the Secretary of the Interior and on file in the local land office at Rapid City, S. Dak.

The limit of area per entry representing the acreage which, in the opinion of the Secretary of the Interior, may be reasonably required for the support of a family on the lands in question, is fixed for the lands entered subject

to the provisions of the reclamation act, at the amounts shown upon the plats for the several farm units.

The limit for which water-right application may be made for lands in private ownership shall be 160 acres of irrigable land for each landowner.

The charges which shall be made per acre of irrigable land upon the said entries, and upon lands in private ownership which can be irrigated by the waters of the said irrigation project are in two parts, as follows:

(1) The building of the irrigation system, \$30 per acre of irrigable land, payable in not less than five nor more than ten annual installments, each not less than \$3 per acre.

(2) For operation and maintenance, which will, as soon as the data are available, be fixed in proportion to the amount of water used, with a minimum charge per irrigable acre whether water is used thereon or not. The operation and maintenance charges for the irrigation season of 1908, and until further notice, will be 40 cents per acre of irrigable land.

The first installment of said charges for all irrigable areas shown on these plats, whether or not water-right application is made therefore or water is used thereon, shall be due and payable on or before December 1, 1908, at the local land office at Rapid City, S. Dak., the total payment for 1908 being not less than \$3.40 per acre. The building charge for subsequent years shall be due and payable at the same place on or before December 1, and until further notice the operation and maintenance charge shall be 40 cents per acre of irrigable land per annum due and payable at the same time and place.

INSTRUCTIONS ACCOMPANYING PUBLIC NOTICE

The public notice of June 21, 1907, was accompanied by directions that the local land officers be instructed to give publicity to the notice, and to announce that water-right applications must be filed in the proper form in the local land office before water can be furnished; that the United States will operate and maintain the storage and diversion dams and main head works, the main canals and main laterals, as shown on a plat of the project approved by the director, copy of which is on file in the office of the engineer in charge of the project, the cost thereof to be included in the operation and maintenance charges; that the amount of water to be furnished is 2 acre-feet per acre per annum; that the building charge and number of annual installments are to be stated in the third paragraph of each application; and that the Secretary of the Interior has entered into a contract with a water users' association on this project, and that the certificate of the water users' association must be filled in.

ORDER DATED MAY 29, 1908.

In pursuance of the public notice issued June 21, 1907, for the Belle Fourche project, South Dakota, under the provisions of the reclamation act of June 17, 1902 (32 Stat. L., 388) and by virtue of the authority contained in section 10 of said act for the establishment of rules and regulations necessary and proper for the purpose of carrying the provisions of the act into full force and effect, the following regulation is hereby promulgated for the said project, namely, that the part of the annual installment covering charges due for operation and maintenance for all the irrigable land included in any water-right application must be paid on or before April 1 of each year, and in default of such payment, except as hereinafter provided, no water will be furnished for the irrigation of such lands. The receiver of public moneys at the local land office at Rapid City, S. Dak., is hereby authorized and directed to receive such portion of the reclamation water-right charges separate and apart from the building charge.

In case the operation and maintenance charges due in connection with any water-right application heretofore made remain unpaid sixty days from the time when notice hereof shall be given the water-right applicant by the engineer of the United States Reclamation Service, the water shall be immediately turned off.

SETTLEMENT

Of the 12,023.03 acres of land opened by the public notice of June 21, 1907, 3,736.73 acres are in public ownership and 8,286.30 are in private ownership. Sixty-seven water-right applications covering 3,736.73 acres have been made for public lands, and 28 applications covering 3,077.6 acres have been made for private lands. The land is free from stones, brush, alkali and, as a general thing, is easily prepared for irrigation. The farm unit averages 80 acres of irrigable land, except within 2 miles of the town site, where the farm unit will average 40 acres of irrigable land. The range around the project is open and affords excellent summer feed for stock.

OPERATION AND MAINTENANCE

During the season of 1908 the following canals and laterals, totaling 48½ miles in length, are being operated to furnish water to 12,000 acres of irrigable land: Inlet canal, 6½ miles long; south canal (north of river), 8 miles long; Johnson lateral, 16 miles long; Sorenson lateral, 5 miles long; Todd lateral, 5 miles long; Miller Butte lateral, 5 miles long; Dry Creek canal (temporary), 3 miles long. On the above canals there are 124 turnouts, but many of them were not in use this year. Less than half of the irrigable area was in crop this year.

Water was turned into the main canals on April 14 for the present irrigation season, but there was no call for it until June 10, after which water was run continuously where wanted. The farmers were very late in using water on account of their farm ditches not being prepared.

The following force was employed on operation and maintenance: One assistant engineer for eight months, one gate tender and ditch rider throughout the year, two ditch riders for six months, one ditch rider for two months, teams and men for repairs when needed.

One slide occurred on inlet canal, one on south canal, and three on the Johnson lateral, caused by the percolation of water from the canal into a layer of gravel overlying shale. This percolation stops to a great degree as soon as muddy water is run through the canals for a considerable period. The slides all occurred in thorough cuts where the least danger was expected. These have all been repaired, generally without turning the water out of the canals. The only suspension in the delivery of water was during the latter part of June when water was out of the Johnson lateral for four days on account of a washout that necessitated the construction of a flume.

CHARACTER OF CROPS

The crops raised during the present season will be about 75 per cent oats and wheat, 10 per cent corn, 10 per cent alfalfa, and 5 per cent potatoes and garden products.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected miscellaneous.....	\$9,244.80		\$9,244.80
Inventories:			
Mercantile stores.....	375.00		
Government animals.....	13,950.64		
Less depreciation.....		\$5,358.29	
Equipment in use.....	24,540.79		
Less depreciation.....		2,436.51	
Storehouse.....	5,410.53		
Cement.....	19,045.31		
Iron and steel.....	10,546.46		
Lumber.....	2,423.98		
Explosives.....	507.65		
Forage.....	2,255.51		
Fuel.....	548.82		
Local products.....	20,760.86		
	100,365.55	7,794.80	92,570.75
Cost of work:			
Building cost.....	1,428,849.11		
Plus adjustments.....	6,108.53		
Less accrued revenues.....		7,779.28	
	1,434,957.64	7,779.28	1,427,178.36
Operation and maintenance cost.....	2,687.11		2,687.11
Total.....			1,531,681.02
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		10,685.46	
Unpaid purchases.....		10,924.02	
Unpaid contract estimates.....		33,416.30	
Unpaid contract holdbacks.....		50,758.26	
Unpaid freight and express.....		10,206.21	
Unpaid passenger fares.....		182.65	
			116,172.90
Investment of the United States:			
Disbursement vouchers.....		1,398,401.94	
Collection vouchers.....	11,132.35		
Transfer vouchers received.....		32,927.06	
Transfer vouchers issued.....	4,688.53		
	15,820.88	1,431,329.00	1,415,508.12
Total.....			1,531,681.02

Total cost to June 30, 1908, distributed to principal physical features

Diversion dam, headworks and gates.....	\$119,898.73
Supply canal:	
Earthwork.....	242,518.98
Crow Creek sluice and gates.....	60,561.98
Other concrete structures.....	7,826.70
Drop at reservoir.....	4,738.52
Highway bridges.....	10,233.05
Flood expense, 1907.....	2,969.37
Belle Fourche reservoir:	
Clearing site.....	437.17
Submerged lands.....	16,696.48
Belle Fourche dam (earthwork and miscellaneous structures) ..	322,257.72
North canal distributing system (earthwork and miscellaneous structures).....	115,529.87

South canal distributing system:

Earthwork and miscellaneous structures.....	\$216, 654. 78
Inverted concrete siphons.....	28, 361. 15
Tunnel.....	45, 404. 53
Concrete culvert.....	1, 702. 04

Lateral distributing system:

Earthwork	118, 159. 01
Concrete and wooden structures.....	31, 182. 52
Preliminary surveys.....	2, 439. 46
Real estate (rights and property).....	28, 596. 97
Buildings (offices, dormitories, warehouses, etc).....	21, 808. 71
Telephone system.....	9, 346. 78
Testing laboratory expense.....	278. 41
Experimental farm.....	8, 875. 90
Irrigable lands (farm unit subdivision and soil examination)...	16, 138. 70
Cost ledger inventories.....	1, 726. 58

Total building cost as per debit in cost of work in state- ment of assets and liabilities.....	1, 428, 849. 11
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UTAH.

BEAR LAKE PROJECT

A detailed description of the Bear Lake project will be found in the third annual report. During the fiscal year all lands withdrawn in connection with this project have been restored to entry. The expenditures on this project for the fiscal year have been for advertising, amounting to \$20.90, making a total expenditure to June 30, 1908, of \$18,782.18.

STRAWBERRY VALLEY PROJECT

GENERAL STATEMENT

The principal data relating to the Strawberry Valley project are summarized as follows:

Counties: Utah and Wasatch.
Townships: 8 and 9 S., Rs. 1 to 3 E., S. L. M.
Irrigable area: 60,000 acres. Ownership, private.
Average elevation of irrigable area: 4,500 to 4,800 feet above sea level.
Average annual rainfall on irrigable area: 18 inches.
Range of temperature on irrigable area: Maximum, 96°; minimum, 18°.
Character of soil of irrigable area: Sandy loam and gravel with a deep black soil in the bottom lands.
Duty of water: 1 second-foot at the headgates per 80 acres.
Principal products: Alfalfa, hay, cereals, sugar beets, fruits, and vegetables.
Railroad stations: Spanish Fork, Payson, and Salem, Utah.
Railroads: Denver and Rio Grande and San Pedro, Los Angeles and Salt Lake.
Principal markets: Salt Lake City, Utah, and adjacent mining districts.
Watershed area: 200 square miles.
Estimated annual rainfall on watershed: 18 inches.
Estimated annual run-off of watershed: 65,600 acre-feet.
Reservoir: Area, 6,800 acres; capacity, 110,000 acre-feet.
Storage dam: Type, rockfill with concrete core wall; height, 45 feet; length, 325 feet.
Diversion dam: Type, reenforced concrete; height, 16 feet; length, 70 feet.
Main canals: Length, 80 miles.
Tunnels: Length, 20,500 feet.
Power development: 3,000 horsepower.
Construction of project authorized: December 15, 1907.
Per cent of project completed: 25.5.

A detailed description of the Strawberry Valley project will be found in the sixth annual report and general descriptions relating to the project are given in the third, fourth, and fifth annual reports. Briefly, the irrigation plan of this project involves the construction of a storage reservoir on the Strawberry River, including the diversion of Indian Creek into the storage reservoir; a tunnel connecting the reservoir with Diamond Fork, a tributary of Spanish Fork River; a diversion dam for diverting water from Diamond Fork into two canals, one on each side of the river, covering land in the Spanish

Fork Valley; a hydro-electric plant on the south side canal at a point about 3 miles below the diversion dam, utilizing for power purposes a portion of the water ultimately used for the irrigation of lands in the vicinity of Spanish Fork; and the enlargement of existing canal systems diverting water from the river at points below the diversion dam referred to. Some work has been done on the Strawberry tunnel, and the diversion dam, power canal, power house, and power-house installation are nearing completion. The power development will be utilized for industrial purposes at various towns in Utah Lake Valley.

STRAWBERRY TUNNEL

Work on the Strawberry tunnel was conducted from one heading at the west portal with two shifts until July 20, 1907, when all operations were suspended to await the completion of the hydro-electric power plant near Spanish Fork, from which it is planned to supply power for the construction of the remainder of the tunnel. Sixteen hundred feet of tunnel have been excavated and timbered, and substantial camp buildings have been erected at the west portal. Work will be resumed on this feature of the project as soon as the hydro-electric power plant has been completed, which will be about November 1, 1908.

POWER CANAL AND POWER PLANT

Construction work on the power canal and power house has been pursued as rapidly as conditions would permit, and all work on these features will be completed within the next three months. The diversion dam and headworks for the power canal were nearly completed on June 30, 1908. The placing of the machinery in the power house is well under way, and the lining of the tunnels and canal with concrete will be completed in a short time. The construction of the power canal has all been done by force account, the settlers living in the valley being employed to do the greater part of the work. In connection with this construction work, a great many small contracts for freighting, clearing, and furnishing gravel and sand have been let to the settlers on the project.

HIGHLAND CANAL

A preliminary survey and an estimate of the cost of construction of the highland canal has been made. This canal is an extension of the power canal and will carry 250 second-feet from the power-house site in Spanish Fork Canyon around the foot of the mountains to Payson Creek. As soon as the final location has been completed, a contract will be entered into with the water users' association to do the construction work cooperatively.

TOPOGRAPHIC SURVEYS

An engineering party was put in the field in the early part of the year for the purpose of completing the topographic survey of the irrigable land under the project. It is expected that this party will complete its work during November, 1908.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Strawberry Valley project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
163	General Electric Co.....	Electrical machinery.....	\$23,282.00	\$26,098.05	Oct. 16, 1907
166	Dayton Globe Iron Works Co.	Water-wheel apparatus.....	12,261.00	10,290.92	Sept. 17, 1907
172	Western States Portland Cement Co.	Cement.....	11,792.84	11,566.50	Sept. 1, 1907
180	Henry Gardner.....	Power-transmission poles.....	2,920.00	* 2,920.00	July 10, 1907
228	do.....	Power-transmission line.....	4,156.00		Aug. 15, 1908
229	Union Iron Works.....	Steel pressure pipe.....	2,410.00	2,346.16	June 12, 1908

* Completed.

SETTLEMENT

The value of land has more than doubled on the project since the commencement of construction work in 1906 and a great many new settlers are purchasing land and getting things ready to plant orchards as soon as water is available.

On a great deal of the land on the project some flood water from the Spanish Fork River is available which enables the owners to raise one crop of alfalfa, if there is plenty of rain in the spring to start it.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable, uncollected miscellaneous.....	\$5.65		\$5.65
Inventories:			
Mercantile stores.....	866.15		
Government animals.....	4,201.15		
Equipment in use.....	10,241.18		
Storehouse.....	89,457.30		
Cost of work:			
Building cost.....	426,099.80		
Plus adjustments.....	3,571.64		
Less accrued revenues.....		\$11,743.84	
	429,671.44	11,743.84	417,927.60
Total.....			522,699.03
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		7,968.39	
Unpaid purchases.....		4,890.92	
Unpaid contract estimates.....		1,876.93	
Unpaid contract holdbacks.....		16,101.46	
Unpaid freight and express.....		2,374.62	
Unpaid passenger fares.....		409.60	
			33,621.92
Investment of the United States:			
Disbursement vouchers.....		507,636.32	
Collection vouchers.....	24,039.51		
Transfer vouchers received.....		11,507.16	
Transfer vouchers issued.....	6,026.86		
	30,066.37	519,143.48	489,077.11
Total.....			522,699.03

Total cost to June 30, 1908, distributed to principal physical features

Strawberry tunnel.....	\$73,302.05
Power house.....	14,983.91
Transmission line.....	11,558.00
Spanish Fork diversion dam.....	30,240.80
Power canal:	
Earth and rock work.....	120,051.66
Concrete lining.....	14,305.33
Concrete structures.....	3,346.11
Power canal tunnels:	
Driving.....	32,042.88
Lining.....	9,035.24
Hydro-electric power plant.....	5,328.59
High line canal.....	2,892.36
Diamond Fork road.....	38,631.04
Real estate (rights and property).....	5,407.25
Buildings:	
Offices, dormitories, warehouses, etc.....	3,094.67
Maintenance of camps.....	9,572.61
Telephone system.....	14,268.68
Hydrography.....	1,028.81
Topography.....	928.30
Examination of project as a whole.....	36,128.69
Cost ledger inventories.....	454.82

Total building cost as per debit in cost of work in statement
of assets and liabilities..... 426,099.80

UTAH LAKE PROJECT

A detailed description of the Utah Lake project will be found in the second annual report. The expenditures on this project for the fiscal year have been for services amounting to \$90.25, making a total expenditure to June 30, 1908, of \$34,049.30.

WASHINGTON
OKANOGAN PROJECT

GENERAL STATEMENT.

The principal data relating to the Okanogan project are summarized as follows:

County: Okanogan.
Townships: 32 to 34 N., Rs. 25 to 27 E.
Irrigable area: 10,000 acres. Ownership, private.
Average elevation of irrigable area: 1,000 feet above sea level.
Average annual rainfall on irrigable area: 8 inches.
Range of temperature on irrigable area: Maximum, 105°; minimum, -10°.
Character of soil of irrigable area: Volcanic ash, sand, and gravel.
Duty of water: 3 acre-feet per acre per annum at point of diversion.
Size of farm units: 40 acres.
Principal products: Grain, hay, fruit, nuts, and vegetables.
Railroad station: Oroville, Wash.
Railroad: Great Northern.
Principal markets: Local towns.
Watershed area: 150 square miles.
Average annual rainfall on watershed: 17 inches.
Estimated annual run-off of watershed: 30,000 acre-feet.
Reservoir: Area, 650 acres; capacity, 15,000 acre-feet.
Storage dam: Type, earth fill; height, 60 feet; length, 1,000 feet.
Diversion dam: Type, concrete weir; height, 4 feet; length, 50 feet.
Main canals: Length, 20 miles.
Laterals: Length, 27 miles.
Construction of project authorized: December 2, 1905.
Per cent of project completed: 74.

A detailed description of the Okanogan project will be found in the fifth annual report, and general descriptions relating to the project are given in the second, third, fourth, and sixth annual reports. Briefly, the irrigation plan of this project involves the construction of a short inlet canal from the Salmon River into Salmon Lake reservoir and outlet works for the same; a storage reservoir controlled by the Conconully dam on the Salmon River about 2 miles below Conconully, Wash.; a diversion dam, on the same stream at a point about 12 miles below the storage dam, diverting water into a canal watering lands in the valley of the Okanogan River lying on the left side of Salmon River between Riverside and Alma, Wash. The construction of all of these works is in progress and the diversion dam and distributing canal system are nearing completion.

CONCONULLY DAM

Construction of the Conconully dam was commenced by force account in July, 1907, and the following features of the dam have been completed: Cut-off trenches, drainage trench, grubbing of site, 855 linear feet of sheet piling, extending to a depth of 36 feet, and the outlet tunnel 395 feet long. The spillway and dam embankment are under construction. The spillway is formed by a cut through a limestone ridge at the west end of the dam and it will be lined with con-

crete. The embankment for the dam is being built by the hydraulic-fill process, water being obtained from the west fork of the Salmon River through a wooden flume 19,000 feet long with a capacity of 15 second-feet. Material for the embankment is obtained from an extensive talus slope near the west end of the dam. The material varies from rocks of from 50 to 60 pounds weight to material passing a No. 200 sieve and occurs in such proportions as will make an excellent dam.

CANALS AND DISTRIBUTING SYSTEM

The diverting and distributing systems are practically finished, and flood waters are being delivered to about 1,000 acres of land at a charge of \$1.50 per acre.

PRINCIPAL CURRENT CONTRACT

The following contains data relating to the principal contract in operation during the fiscal year ending June 30, 1908:

No. 94; contractor, Pacific Portland Cement Co.; feature, cement; estimated value, \$4,458; estimated earnings, June 30, 1908, \$4 458; completion due, July 1, 1907.

OPERATION AND MAINTENANCE

The delivery of flood water during the month of June, 1908, has gone far toward showing that the project will be a success. A great number of young orchards have been planted and are doing splendidly on the flood waters. The lands under this project are first-class fruit lands and will undoubtedly pay a handsome profit after paying the cost of the irrigation works.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Inventories:			
Government animals.....	\$500.00		\$16,678.09
Equipment in use.....	7,772.21		
Cement.....	7,277.54		
Lumber.....	824.34		
Fuel.....	304.00		
Cost of work:			
Building cost.....	377,476.10		\$1,912.50
Plus adjustments.....	1,244.94		
Less accrued revenues.....		\$1,912.50	
	378,721.04	1,912.50	376,808.54
Total.....			393,486.63
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		5,633.33	10,336.23
Unpaid purchases.....		3,094.24	
Unpaid freight and express.....		1,509.57	
Unpaid passenger fares.....		99.09	
Investment of the United States:			
Disbursement vouchers.....		377,978.23	383,150.40
Collection vouchers.....	1,975.14		
Transfer vouchers received.....		8,997.04	
Transfer vouchers issued.....	1,849.73		
	3,824.87	386,975.27	383,150.40
Total.....			393,486.63

Total cost to June 30, 1908, distributed to principal physical features

Salmon Lake storage reservoir:	
Supply canal.....	\$1, 619. 25
Outlet works.....	1, 363. 54
Conconully storage reservoir:	
Submerged lands.....	27, 705. 57
Clearing reservoir site.....	4, 401. 75
Conconully dam.....	53, 202. 94
Spillway.....	19, 939. 05
Outlet works.....	13, 904. 99
Diverting system:	
Diversion dam.....	3, 517. 07
Main canal.....	163, 459. 26
Hydrography.....	40. 11
Wagon roads.....	903. 50
Buildings (offices, dormitories, warehouses, etc.).....	5, 762. 43
Telephone system.....	2, 284. 18
Irrigable lands (farm unit subdivisions).....	1, 596. 11
Examination of project as a whole.....	35, 438. 15
Administration of project as a whole.....	32, 834. 88
Cost ledger inventories.....	9, 503. 32

Total building cost as per debit in cost of work in statement
of assets and liabilities..... 377, 476. 10

PALOUSE PROJECT

A general description of the Palouse project will be found in the third annual report. All lands withdrawn in connection with this project were restored to entry during the fiscal year. Expenditures on the project for the fiscal year have been for services, travel, and advertising, amounting to \$72.50, making a total expenditure to June 30, 1908, of \$76,216.64.

SUNNYSIDE PROJECT

GENERAL STATEMENT

The principal data relating to the Sunnyside project are summarized as follows:

Counties: Yakima and Benton.

Townships: 8 to 12 N., Rs. 19 to 25 E., W. M.

Irrigable area: 90,000 acres.

Average elevation of irrigable area: 700 feet above sea level.

Average annual rainfall on irrigable area: 7 inches.

Range of temperature on irrigable area: Maximum, 110°; minimum, 0°.

Character of soil of irrigable area: Deep volcanic ash and gravel.

Duty of water: 3 acre-feet per acre per annum.

Size of farm units: 20, 40, and 80 acres.

Principal products: Forage, hops, vegetables, and fruits.

Railroad stations: Grandview, Sunnyside, Outlook, and Granger, Wash.

Railroad: Northern Pacific.

Principal markets: Seattle, Tacoma, and Spokane, Wash., and eastern points.

Source of water supply: Yakima River supplemented by storage.

Diversion dam: Type, concrete weir; height, 8 feet; length, 500 feet.

Main canals: Length, 60 miles.

Laterals: Length, 210 miles.

Power development: 2,000 horsepower.

Construction of project authorized: December 12, 1905.

Per cent of project completed: 20.5.

A detailed description of the Sunnyside project will be found in the sixth annual report, and general descriptions relating to the project are given in the fourth and fifth annual reports. Briefly, the irrigation plan of this project involves the construction of a diversion dam on the Yakima River, near Parker, Wash., diverting water on the left bank of the river into the existing Sunnyside canal, covering lands north of the Yakima River; the enlargement, improvement, and extension of this canal, both on the north and south sides of the river; and the development of power plants at various drops on the canal laterals. The water supply for this project depends on the flow of the Yakima River, controlled by storage in lakes in the proper drainage area of this river. (See Yakima storage.) The diversion dam has been completed, the enlargement, improvement, and extension of the canal are in progress, and the power development yet remains to be undertaken.

A detailed report and estimates of the cost of the main features of the Sunnyside project yet to be constructed at the time of rendering the report were completed and considered by a board of engineers convened in Portland in November, 1907. At a meeting held at Sunnyside in February, 1908, the general engineering features of the project were considered and a general program was tentatively outlined for construction and expenditures, which was duly approved by the director.

SUNNYSIDE DAM

Work on the diversion dam on the Yakima River, which was stopped on account of floods in February, 1907, was resumed on July 10 of that year and the dam was finally completed on October 17.

ZILLAH WASTEWAY

The Zillah wasteway, with exception of the headworks, was completed during the summer. The concrete headworks of the wasteway designed to form part of a drop in the main canal were begun as soon as the water was turned out of the canal in November, 1907, and finished February 14, 1908. This work was all done by force account.

DROPS AND CHECKS

The present capacity of the Sunnyside canal is about 650 second-feet. The enlarged canal will have a capacity of over 1,000 second-feet. To avoid undue increase in velocity a standard drop, built of concrete with steel brackets for holding flashboards, was designed. The construction of some of the drops was begun in November, 1907, and finished in February, 1908. During this time fourteen drops, partially controlling about 34 miles of the main canal, were completed. This work was all done by force account.

EXTENSION OF MAIN CANAL

Proposals for the extension of the main canal for 3½ miles were opened December 23, 1907, and contract was awarded for the work. The work was commenced January 22, 1908, and continued without

interruption until it was finished and accepted April 18. The lateral under this extension, with its heading at mile 56.11, was in the meantime constructed by force account, proposals having been opened February 8 and having been rejected as unsatisfactory. Work thereon was commenced February 14 and finished April 3, including the construction of a concrete wasteway at the end of the extension of the main canal.

PUMPING PLANTS

Some topographic surveys have been made to cover the areas included under various pumping plants, and some preliminary studies relating thereto have been made. These pumping plants will receive power from falls in the various laterals and will irrigate about 10,000 acres of land. Also from 5,000 to 7,000 acres above the main canal may be covered by private pumping plants.

RIGHT OF WAY FOR MAIN CANAL

Surveys of right of way for the main canal were started early in January, 1908, and the field work practically completed during March. A complete set of maps on a scale of 100 feet to the inch has been started, and is about 65 per cent completed.

SULPHUR CREEK WASTEWAY

The preparation of alternative plans and the survey of routes for the Sulphur Creek wasteway were started early in January, and a final location has been selected. The wasteway will consist of 5,800 feet of canal with concrete-lined section, 37,400 feet of unlined canal, and 21 concrete drops. Detailed estimates for the unlined section and a recommendation to proceed with the construction thereof were made and proposals for such construction are now being advertised for. It seems desirable, however, to make further study of the lined section on account of the lack of sufficient information as to the rate of discharge of drainage water and the movement and rate of flow of underground water. A complete system of test wells has been sunk throughout the valley and a number of weirs have been installed in the drainage lines, so that the depth of ground water and the flow of drainage water may be continuously observed.

MABTON DIVISION

New studies were commenced early in January for the Mabton division, contemplating the irrigation of about 9,000 acres of land on the south side of the river. Complete surveys and location, including a full line of soundings for materials, were made for the Mabton division.

The Mabton division as located consists of 8,000 feet of feeder canal, with a capacity of 100 second-feet at the intake, 3 miles of pipe line, and about 8 miles of lateral canals varying in capacity from 90 second-feet to 20 second-feet. The pipe line consists of 3,200 feet of 54-inch reinforced concrete pipe, 1,500 feet of 48-inch wood-stave pipe, and the remainder of 55-inch wood-stave pipe. The 48-inch wood-stave pipe will be used for crossing Yakima River.

Proposals were opened for the construction of the pipe trench in June, 1908. The proposals were all unsatisfactory and were rejected, and the work is now being done by force account. The work was commenced June 20. Proposals for the wood-stave pipe were opened June 2 and contract awarded therefor June 30. Proposals for the feeder canal were opened June 15, and were all rejected as unsatisfactory. Arrangements have been made to do this work by force account.

A yard has been located and graded at Grandview, Wash., for the manufacture of reenforced concrete pipe to be used in the pipe lines on the Mabton division. An extension of the railway spur has been graded, a warehouse for cement built, and general equipment collected.

A pile-driving machine for the construction of a cofferdam necessary in connection with the excavation of the trench for the 48-inch wood-stave pipe has been delivered at Grandview and is being hauled to the river crossing.

OFFICE BUILDING

There being no adequate accommodations to be found at Sunnyside for the office force and headquarters for the construction department, the construction of an office building has been authorized and is nearly completed. The office building is being built under contract with the exception of the concrete foundation, which was built by force account.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Sunnyside project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
94	Pacific Portland Cement Co.....	Cement.....	\$1,039.50	\$1,039.50	July 1, 1907
140	Pacific Portland Cement Co.....	do.....	808.75	808.75	June 1, 1908

SETTLEMENT AND DEVELOPMENT

The major portion of the settlement and development of the Sunnyside project has occurred within the past eight years, and more particularly since the property was purchased by the United States. There are on the project now over 17,000 people, five prosperous towns, four flourishing banking institutions, many substantial business houses, and numerous schools and churches. During the past year there has been an increase of about 3,000 in population. The size of the average farm is about 30 acres, with a tendency toward a smaller unit. The project produces live stock and dairy products and a large range of crops, such as fruits, alfalfa, timothy, clover, potatoes, and other vegetables. Canning factories were built at Granger and Sunnyside during the past year and others are pro-

jected at Zillah, Parker, and Grandview, the soil being well adapted to the production of asparagus, tomatoes, sweet corn, and other vegetables suitable for canning.

OPERATION AND MAINTENANCE

The Sunnyside canal and the lateral system have been successfully operated during the irrigation seasons of the fiscal year without breaks or serious mishaps of any kind and with satisfactory delivery of water to the water users. The area of land receiving water during 1907 was approximately 40,000 acres, and the irrigated area on June 30, 1908, was approximately 43,000 acres. The operating force during the irrigation seasons has consisted of 1 water superintendent and 12 patrolmen. The following is a summary of the water delivered during the fiscal year: Maximum second-feet of water diverted, 601; minimum second-feet of water diverted, 198; daily average second-feet of water diverted, 487; total acre-feet of water diverted, 210,140; acres served, 43,000; acre-feet per acre diverted, 4.88; acre-feet per acre delivered, 3.37.

When the Sunnyside canal property was taken over by the United States it was found to be in an unsatisfactory state of repair, nothing having been done along betterment lines by the irrigation company for several years previous. The property is now in a good state of repair and in a serviceable operating condition. A large part of the work required for this result has been done during the last fiscal year. Very little in the way of new construction work has been performed by the operating department, and such work as was done has been confined mainly to the installation of measuring boxes, weirs, and a number of canal headings or turn-outs. The number of measuring boxes installed during the fiscal year was 371.

IRRIGATION RESULTS

Some of the crop returns of the Sunnyside district were phenomenal during 1907, ranging from \$1,000 to \$3,000 per acre in a number of instances. It should be stated, however, that these returns are exceptional. The total irrigated area, aggregating 40,000 acres, produced crops of a value of over \$2,000,000, an average of over \$50 per acre. It might be said in explanation that the average returns per acre of land was considerably more than the figure named, as a large portion of the irrigated area was planted in new orchards and grasses, such as alfalfa, timothy, and clover.

NEW GOVERNMENT WATER-RIGHT CONTRACTS

The new government water-right agreements mentioned in the sixth annual report for old water-right lands, offering a rate of \$10 per acre, payable in one or five installments were submitted to the owners of such lands during the month of July, 1907. A general effort was made to induce the landowners to sign the new contracts. This effort has resulted in securing contracts for 23,757.55 acres of the total of 38,396.96 acres affected, or 62½ per cent of the whole.

ENGINEERING

One assistant engineer and one field engineer have been employed, mainly in locating and staking out laterals and delivery works, setting grades for measuring boxes, determining irrigable areas, and doing other work required by the operating department. In addition to the above force, a hydrographer and one assistant have been employed in rating the main canal at the different gaging stations, locating and supervising the installation of pumping plants, determining and locating power possibilities, and doing other work.

SEEPAGE AND EVAPORATION INVESTIGATIONS

During the month of May, 1908, preparations were made for the determination of seepage losses on four laterals representative of the various soils and conditions encountered on the project. These laterals were first placed in complete operating condition, and observations were taken each day as near 6 a. m. and 6 p. m. as possible. The flow was measured by means of weirs, the coefficients of which were determined by actual tests. The collection of seepage data and the preparation and maintenance of the laterals selected for this purpose was done by a man and four boys employed as observers. The following is a summary of the results thus far obtained: Total acre-feet diverted into the four experimental laterals, 1,226; total acre-feet diverted through measuring boxes, 1,109; total acre-feet lost by seepage and evaporation, 117; per cent of loss, 10.

FINANCIAL STATUS AND FEATURE COSTS

Assets and Liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected water-right building charges.....	\$623. 40		\$623. 40
Inventories:			
Equipment in use.....	8,013. 01		11,763. 80
Storehouse.....	3,649. 09		
Forage.....	101. 70		
Cost of work:			
Building cost.....	521,682. 79		509,168. 17
Plus adjustments.....	1,284. 34		
Less accrued repayments.....		\$13,798. 96	
	522,967. 13	13,798. 96	
Operation and maintenance cost.....	81,533. 15		Cr. 23,892. 49
Less accrued revenues.....		105,425. 64	
	81,533. 15	105,425. 64	
Total.....			497,662. 88
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		\$7. 99	5,601. 88
Unpaid purchases.....		4,580. 96	
Unpaid contract estimates.....		149. 42	
Unpaid freight and express.....		773. 51	
Investment of the United States:			
Disbursement vouchers.....		424,310. 90	492,061. 00
Collection vouchers.....	109,772. 32		
Transfer vouchers received.....		138,725. 80	
Transfer vouchers issued.....	21,708. 47		
	131,475. 79	632,536. 79	
Total.....			497,662. 88

Total cost to June 30, 1908, distributed to principal physical features.

Storage reservoir.....	\$75, 894. 63
Sunnyside canal system:	
Purchase price.....	248, 690. 64
Diversion dam.....	49, 390. 52
Reinforced concrete drops (14).....	32, 449. 85
Zillah wasteway—	
Earthwork and structures.....	19, 876. 13
Headworks.....	9, 389. 17
Sulphur Creek wasteway (examination and location).....	4, 704. 33
Outlook pumping proposition (examination and location).....	913. 84
Euclid pumping proposition (examination and location).....	654. 78
Prosser extension—	
Earthwork.....	12, 238. 35
Concrete structures.....	864. 96
Right-of-way map.....	1, 681. 74
Mabton division—	
Examination and location.....	8, 623. 42
River crossing for pipe line.....	267. 38
Earthwork for structures.....	733. 80
Concrete pipe (54-inch) and forms.....	2, 679. 21
Lateral distributing system, earthwork.....	3, 408. 10
Drainage investigations.....	1, 036. 54
Buildings (offices, dormitories, warehouse, etc.).....	2, 376. 27
Administration of project as a whole.....	45, 618. 42
Cost ledger inventories.....	190. 71
<hr/>	
Total building cost, as per debit in cost of work statement of assets and liabilities.....	521, 682. 79

TIETON PROJECT

GENERAL STATEMENT

The principal data relating to the Tieton project are summarized as follows:

County: Yakima.

Townships: 12 to 15 N., Ra. 15 to 19 E., W. M.

Irrigable area: 80,000 acres. Ownership, private.

Average elevation of irrigable area: 1,200 to 2,100 feet above sea level.

Average annual rainfall on irrigable area: 9 inches.

Range of temperature on irrigable area: Maximum, 108°; minimum, 0°.

Character of soil of irrigable area: Volcanic ash.

Duty of water: 1 second-foot per 100 acres.

Size of farm units: 40 to 80 acres.

Principal products: Forage, hops, and fruits.

Railroad stations: Yakima, North Yakima, and Naches, Wash.

Railroad: Northern Pacific.

Principal markets: Seattle, Tacoma, and Spokane, Wash., and eastern points.

Source of water supply: Tieton River.

Diversion dam: Type, concrete weir; height, 3 feet; length, 110 feet.

Main canals: Length, 12 miles.

Laterals: Length, 51 miles.

Tunnels: Length, 11,000 feet in 4 tunnels.

Power development: 4,000 horsepower.

Construction of project authorized: December 12, 1905.

Per cent of project completed: 34.

A detailed description of the Tieton project will be found in the sixth annual report, and general descriptions relating to the project are given in the fourth and fifth annual reports. Briefly, the irrigation plan of this project contemplates the construction of a storage reservoir on Bumping River, a diversion dam on the Tieton River

at a point about 16 miles above its junction with the Naches River, and a canal heading at the diversion dam on the right bank of the Tieton River and conducting water into the lower Naches Valley in the vicinity of Naches and North Yakima. The main canal is now under construction, and the diversion dam and canal headworks will be constructed during the latter part of 1908.

OPEN CANAL EXCAVATION

After advertising a number of times without receiving a satisfactory proposal, the work of excavating the open canal by force account was authorized. It is estimated that there will be 252,000 cubic yards of material to move. Of this amount, 177,000 cubic yards have already been excavated.

TUNNEL EXCAVATION

Three tunnels, with a total length of 9,662 feet, are being driven by force account. The power drills in these tunnels were started in July and August of 1907, and 8,251 feet have been driven during the past year. Air and air-electric drills are being used. One tunnel, 1,200 feet long, was driven by contract. This was begun in July, 1907, and completed in April, 1908.

CONCRETE LINING FOR OPEN CANAL AND TUNNELS

The lining for open canal and tunnels was covered by the contract for manufacturing and placing concrete shapes. The contractor, after getting his plant on the ground and manufacturing shapes from August to November, 1907, was unable to complete preparations for work in 1908, and the contract was consequently suspended on February 1, 1908. The work of completing the contract was at once undertaken by force account. On account of delays consequent upon this suspension, it will probably be necessary to postpone the commencement of the delivery of water until 1910. It is planned, however, to have about 5 miles of the canal completely lined during 1908.

WASTEWAYS

A study of conditions has made it apparent that numerous wasteways will be necessary on account of danger of breaks from various causes on the steep side hill of the canyon division. It is planned to install these wasteways about 2 miles apart, making a total of five wasteways necessary. These wasteways will be made as nearly automatic as possible. Their operation will be controlled by floats, at various points along the canal, connected with the operating mechanism of the waste gates by electric circuits.

NACHES BRANCH

Plans and specifications for construction of the Naches branch of the main canal were completed and proposals received on January 27, 1908, but on account of the delay caused by the necessity of suspend-

ing the contract for manufacturing and placing concrete shapes in the canyon division and the consequent impossibility of completing that division in 1908, all proposals were rejected.

DISTRIBUTION SYSTEM

The location of the distribution system, surveys of irrigable lands thereunder, and the division of the land into farm units are being completed, and it is expected to advertise for proposals for the construction of the first unit of this system in the latter part of 1908.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Tieton project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
71	Pacific Portland Cement Co.	Cement	\$2,852.00	\$2,852.00	
94	do	do	2,260.50	2,260.50	July 1, 1907
140	do	do	38,048.80	24,960.00	June 1, 1908
147	Theodore Welsberger.	Main canal, manufacturing and placing concrete shapes.	229,435.39	a 20,374.58	Oct. 15, 1908
149	Expanded Metal and Corrugated Bar Co.	Steel bars	38,315.99	b 39,823.20	Oct. 15, 1907
185	A. G. Moodhe	Columnar tunnel	18,152.00	b 15,744.27	Apr. 15, 1908

* Suspended Feb. 1, 1908.

b Completed.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected miscellaneous	\$777.05		\$777.05
Inventories:			
Mercantile stores	3,836.30		
Government animals	4,944.00		
Equipment in use	51,548.48		
Storehouse	35,861.07		
Cement	4,161.10		
Lumber	2,135.18		
Explosives	2,184.57		
Forage	479.14		
Fuel	971.45		
Unadjusted transfers		\$9,867.90	
	106,121.29	9,867.90	96,253.39
Cost of work:			
Building cost	718,916.51		
Less adjustments		3,620.62	
Less accrued revenues		1,826.44	
	718,916.51	5,447.06	713,469.45
Total			810,499.89

Assets and liabilities on June 30, 1908—Continued

Items.	Debits.	Credits.	Amounts.
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		\$18,162.63	} \$83,247.02
Unpaid purchases.....		33,970.31	
Unpaid contract estimates.....		1,029.49	
Unpaid contract holdbacks.....		2,408.79	
Unpaid freight and express.....		26,156.45	
Unpaid passenger fares.....		70.20	
Unredeemed coupon books.....		488.85	
Unpaid miscellaneous.....		872.30	
Investment of the United States:			
Disbursement vouchers.....		553,764.04	
Collection vouchers.....	\$5,965.37		
Transfer vouchers received.....		154,492.03	
Transfer vouchers issued.....	5,087.83		
	11,003.20	738,256.07	747,252.87
Total..			810,499.89

Total cost to June 30, 1908, distributed to principal physical features

Storage reservoirs	\$77,920.36
Diversion dam	816.25
Main open canal:	
Earthwork (177,008 yards and tile drains)	113,640.68
Concrete structures.....	162,637.75
Tunnels:	
Driving Trail Creek.....	35,436.11
Driving Steeple.....	1,664.71
Driving Columnar.....	18,305.94
Driving Tieton.....	34,693.43
Driving North Fork.....	42,255.55
Power plant:	
Power house.....	24,283.49
Transmission line.....	8,056.98
Tramway.....	2,201.10
Pipe lines.....	6,929.21
Real estate (rights and property).....	2,755.35
Buildings:	
Offices, dormitories, warehouses, etc.....	13,223.70
Maintenance of camps.....	8,177.98
Wagon roads.....	31,024.94
Telephone system.....	4,005.51
Examination and surveys (valley division).....	34,069.45
Administration of project as a whole.....	94,033.52
Cost ledger inventories.....	2,784.60

Total building cost as per debit in cost of work in statement
of assets and liabilities..... 718,916.51

WAPATO PROJECT**GENERAL STATEMENT**

The principal data relating to the Wapato project are summarized as follows:

County: Yakima.

Townships: 10 to 12 N., Ra. 17 to 21 E., W. M.

Irrigable area: 120,000 acres. Ownership, Indian lands.

Average annual rainfall on irrigable area: 7 inches.

Range of temperature on irrigable area: Maximum, 110°; minimum, 0°.

Character of soil of irrigable area: Volcanic ash.

Duty of water: 1 second-foot per 120 acres.

Size of farm units: Probably 40 acres.

Principal products: Forage, crops, melons, and fruits.

Railroad stations: Toppenish, Wapato, and Parker, Wash.

Railroad: Northern Pacific.

Principal markets: Seattle, Tacoma, and Spokane, Wash., and eastern points.

Source of water supply: Yakima River supplemented by storage.

Diversion dam: Type, concrete weir; height, 7 feet; length, 500 feet.

Main canals: Length, 52 miles.

Laterals: Length, 68 miles.

Construction of project authorized: June 16, 1906.

A detailed description of the Wapato project will be found in the fifth annual report, and general descriptions relating to the project are given in the sixth annual report. Briefly, the irrigation plan of this project contemplates the utilization of an existing masonry diverting dam on the Yakima River constructed for the Sunnyside project by the Reclamation Service and canal systems constructed by the Office of Indian Affairs for the Yakima Indians, the enlargement of these canal systems, and the construction of drainage facilities for lands on the right side of the Yakima River in the vicinity of Toppenish. The water supply for this project depends upon the flow of Yakima River, controlled by storage in lakes in the upper drainage area of this river. (See Yakima storage.) All of the new features of this project remain for future construction.

During the last session of Congress additional legislation was passed providing for the sale of lands belonging to incompetent and minor Indians, which simplifies somewhat the legal phase of this project. It is expected to begin investigation soon for the purpose of making a definite estimate and plans for construction. Certain lands have been withdrawn from entry for construction purposes.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Cost of work:			
Building cost.....	\$4,470.28		
Plus adjustments.....	155.64		
Total.....			4,625.92
LIABILITIES.			
Investment of the United States:			
Disbursement vouchers.....		\$3,186.53	
Transfer vouchers received.....		1,439.39	
Total.....			4,625.92

Total cost to June 30, 1908, distributed to principal physical features

Preliminary examination and surveys..... \$4,470.28

YAKIMA RESERVATION PROJECT (INDIAN SERVICE)

Plans have been considered by the Office of Indian Affairs for the inclusion of the present irrigation system on the Yakima Indian Reservation on the Yakima River near North Yakima, Wash., in the Wapato project of the Reclamation Service. The coalescing of

these projects was authorized by the act of Congress approved March 6, 1906, providing for repayment from Indian funds of a proportionate share of the cost of construction and of operation and maintenance and for the inclusion in the Wapato project of the present system in use by the Indians at a price to be determined by the Secretary of the Interior. On May 10, 1907, the Secretary approved a joint recommendation made by the Director of the Reclamation Service and the Commissioner of Indian Affairs to consider the value of the present irrigation system on the reservation to be \$121,000. The expenditures during the present year on this project have been for preliminary surveys, amounting to \$127.63.

YAKIMA STORAGE

GENERAL STATEMENT

The principal data relating to the storage of water in the Yakima basin are summarized as follows:

Projects: Sunnyside, Tieton, and Wapato, and proposed Benton and Kittitas. Watershed area: 5,050 square miles.

Estimated annual run-off of watershed: 3,298,000 acre-feet.

Reservoirs: Bumping Lake, area, 1,200 acres; capacity, 30,000 acre-feet. Lake Clealum, area, 5,000 acres; capacity, 426,000 acre-feet. Lake Kachess, area, 4,800 acres; capacity, 225,000 acre-feet. Lake Keechelus, area, 2,600 acres; capacity, 142,000 acre-feet. McAllister's Meadows, capacity, 115,000 acre-feet.

Storage dams: Bumping Lake, type, earth fill; height, 40 feet. Lake Clealum, type, earth fill; height, 138 feet. Lake Kachess, type, earth fill; height, 73 feet. Lake Keechelus, type, earth fill; height, 64 feet. McAllister's Meadows, type, rock fill; height, 160 feet.

A detailed description of storage plans for regulating the flow of Yakima River and its tributaries and general descriptions relating thereto are given in the third, fourth, and fifth annual reports. Briefly, the storage plan for the Yakima basin contemplates the construction of earth fill dams at the outlets of Bumping Lake, lakes Clealum, Kachess, and Keechelus and a rock fill dam at McAllister's Meadows for the benefit of the Sunnyside, Tieton, and Wapato projects and the proposed Benton and Kittitas projects. Temporary crib dams have been completed on the outlets of lakes Clealum and Keechelus and a temporary crib dam at the outlet of Lake Kachess has been taken over. All of the contemplated permanent features of the work remain to be completed.

BUMPING LAKE RESERVOIR

The road being built from Naches to Bumping Lake by the State of Washington and the Reclamation Service has been completed to within about 18 miles of the lake and the State appropriation for the construction thereof has been exhausted.

LAKE CLEALUM RESERVOIR

The temporary crib dam at the outlet of Lake Clealum was completed November 9, 1907, and impounds about 23,000 acre-feet of water.

LAKE KACHESS RESERVOIR

The work done in connection with the Lake Kachess reservoir consisted of the maintenance and operation of the temporary works and of investigations for securing data for the design of permanent storage works.

LAKE KEECHELUS RESERVOIR

The work done in connection with the Lake Keechelus reservoir consisted of the maintenance and operation of the temporary works.

TELEPHONE LINES

Telephone lines are being constructed from the nearest point of connection with telephone and telegraph systems to each of the reservoirs now being operated.

TIMBER

The timber around Bumping Lake and lakes Clealum, Kachess, and Keechelus that would be submerged by raising the water in the lakes was offered for sale. The proposals for the purchase of this timber were opened on September 2, 1907, and again on June 1, 1908, but were rejected in both instances as unsatisfactory. The approximate amount of timber involved is as follows:

Standing timber on Yakima storage reservoir sites

Lake.	Timber.	Railroad ties.	Telephone poles.
	<i>Feet B. M.</i>		
Bumping Lake.....	5,627,100	6,320	247
Lake Keechelus.....	28,136,700	1,180	730
Lake Kachess.....	10,119,620	3,802	374
Lake Clealum.....	19,908,375	7,168	704
Total.....	63,791,795	18,470	2,055

WYOMING

SHOSHONE PROJECT

GENERAL STATEMENT

The principal data relating to the Shoshone project are summarized as follows:

County: Big Horn.
Townships: 52 to 58 N., Rs. 97 to 103 W., sixth principal meridian.
Irrigable area: 131,900 acres. Ownership, public, 123,000 acres; State and school, 7,680 acres; private, 1,220 acres.
Average elevation of irrigable area: 4,500 feet above sea level.
Average annual rainfall on irrigable area: 6 to 10 inches.
Range of temperature on irrigable area: Maximum, 95°; minimum, -20°.
Character of soil of irrigable area: Light sandy and clay loams.
Duty of water: 1 second-foot per 80 acres.
Size of farm units: 40 to 80 acres.
Principal products: Hay and grain.
Railroad stations: Cody, Corbett, Ralston, Powell, Garland, Mantua, and Frannie, Wyo.
Railroad: Chicago, Burlington and Quincy.
Principal markets: Local towns.
Watershed area: 1,380 square miles.
Average annual rainfall on watershed: 15 inches.
Estimated annual run-off of watershed: 1,000,000 acre-feet.
Reservoir: Area, 6,600 acres; capacity, 456,000 acre-feet.
Storage dam: Type, concrete arch; height, 325½ feet; length, 200 feet.
Diversion dam: Corbett, type, reinforced concrete gravity; height, 18 feet; length, 400 feet. Willwood, not designed.
Dike: Length, 440 feet.
Main canals: Length, 60 miles.
Laterals: Length, 150 miles.
Tunnel: Length, 3½ miles.
Construction of project authorized: February 10, 1904.
Per cent of project completed: 40.

A detailed description of the Shoshone project will be found in the fifth annual report, and general descriptions relating to the project are given in the second, third, fourth, and sixth annual reports. Briefly, the irrigation plan of this project involves the construction of a storage reservoir, controlled by the Shoshone dam, on Shoshone River at a point about 8 miles above Cody, Wyo.; a high-line canal diverting water from the Shoshone reservoir around the left end of the Shoshone dam and covering lands in the vicinity of Cody, Corbett, Eagle Nest, and Ralston; a diversion dam at Corbett, about 16 miles below the Shoshone dam, diverting water on the left side of the river through the Corbett tunnel into a canal covering lands in the vicinity of Ralston, Powell, Garland, Mantua, and Frannie; and a diversion dam on the Shoshone River near Eagle Nest, at a point about 21 miles below the Shoshone dam, diverting water through a tunnel on the right side of the Shoshone River into a canal covering

lands in the Shoshone River Valley. The Corbett diversion dam and a portion of the canal system controlled by it are completed. The Shoshone dam and another portion of the canal system controlled by the Corbett dam are at present under construction, the other features of the project remaining for future construction.

SHOSHONE DAM

The maximum flood of 1907 occurred July 4, causing the failure of a log boom located about 2 miles above the Shoshone dam site. Several hundred logs passed over the temporary diverting dam, damaging it to such an extent that about 100 feet of it went out the following day. Repairs to the temporary diverting dam, the connection thereof with the flume and outlet tunnel, and the construction of a flume extending downstream from the lower end of the outlet tunnel were not completed until late in November, and no work was done on the excavation for the foundation of the permanent dam until December 2, 1907. Two ten-hour shifts were employed throughout the winter on this excavation. Bed rock was reached February 4, 1908, but the deepest point of the foundation was not reached until April 1. The placing of concrete in the dam was begun March 30, and continued until April 12, when a rise in the river flooded the excavation. Not until April 26 had the water sufficiently subsided to be carried by the flume. The excavation was freed of water by April 29 and the placing of concrete resumed. A second rise in the river May 2 ended the placing of concrete for the season. The upstream portion of the dam, containing 4,200 cubic yards of masonry, had been brought to an elevation 3 feet above the original river bed. Only about one-fifth of the concrete below the river bed had been placed, however, and the high water completely refilled the excavated pit, making necessary a large quantity of reexcavation the coming season.

The summer flood of 1908 has not risen to the excessive volume of the two preceding years. Although the temporary dam is badly crippled by the repeated assaults of the river and the log drives, it remains in serviceable condition for diverting the river into the flume, and there are good prospects for the early resumption of work when the river drops to flume capacity. Considerable new plant has been installed and arrangements have been perfected that should insure active and rapid work. The contract for the construction of Shoshone dam expires March 1, 1909.

The excavation, by force account, of two adits to the outlet tunnel was begun in October, 1907. One of these adits is situated above the dam, and will serve as an intake; and the other, located below the dam, will serve as an entrance to the gate chamber. These, together with the gate chamber, were completed early in June, 1907.

The contractor for furnishing and installing the high-pressure gates began operations preliminary to erection in May, 1908. The actual placing of the gates and appliances was begun June 18. At the end of June all heavy castings were in place. The contractor is thoroughly equipped and is making satisfactory progress. It is expected that the contract will be completed on time, so that the tunnel will be available for diverting the river immediately after the subsidence of the summer floods.

CORBETT DAM

The Corbett dam, the purpose of which is to divert water into the Corbett tunnel, is located on the Shoshone River 8 miles below Cody. It is a reenforced concrete structure, containing about 5,000 cubic yards of concrete and about 320,000 pounds of steel reenforcement. It is of the buttressed type, having on the upstream side a deck $2\frac{1}{2}$ feet thick, sloping 1 to 1, and supported by buttresses 2 feet thick, spaced 14 feet on centers. The buttresses rest upon a concrete floor 2 feet in thickness, continued downstream in a concrete apron of same thickness for a distance of 35 feet below the crest line of the dam. The concrete floor and apron rest upon gravel and shale. Three longitudinal cut-off walls extend from the floor and apron into the shale. The dam raises the low-water elevation of the river $10\frac{1}{2}$ feet. The length between abutments is 400 feet. At the left end of the dam are located the sluiceways and the head works of the Corbett tunnel. From the right abutment an earth embankment extends to a high bench, a distance of 440 feet.

On June 30, 1907, about 75 per cent of the work was completed and operations had been suspended on account of high water. The contractor had completed both abutments, the tunnel headworks, the eastern embankment, and all but about 160 feet in length of the concrete dam, the uncompleted section being at the river channel. Work was resumed September 15, 1907, and at the end of December the dam was completed with the exception of some backfilling and setting the gates. All work was finally completed March 18, 1908.

CORBETT TUNNEL

The excavation of the Corbett tunnel was completed by the end of July, 1907, the tunnel lining by the end of October, and all work except caring for the plant by the end of November, 1907.

EXCAVATION OF GARLAND CANAL, DIVISION 1

Progress on excavation of Garland canal, division 1, has been slow, the contract time expiring September 1, 1907, with only 79 per cent of the work completed. It was necessary to order a suspension of the work near the canal intake for a time in order that the canal headworks might be constructed, and later, in November, the work on the high embankment was suspended because of freezing weather. On account of these and other delays the contractor was granted an extension of time. The work was 99 per cent completed at the end of April, 1908, and was not entirely completed June 30, 1908. The canal at station 293, where carried in embankment across a deep ravine, was lined with concrete by force account.

STRUCTURES ON GARLAND CANAL, DIVISION 1

The structures on Garland canal, division 1, were completed February 28, 1908.

EXCAVATION OF GARLAND CANAL AND LATERALS, DIVISIONS 2 TO 19

The excavation of Garland canal and laterals, divisions 2 to 19, was carried on in a satisfactory manner and at a satisfactory rate, all being completed within the contract time limit.

STRUCTURES ON GARLAND CANAL AND LATERALS, DIVISIONS 2 TO 19

The structures on Garland canal and laterals, divisions 2 to 19, consisting of drops, checks, bridges, bridge piers, turnouts, and culverts, were constructed by force account. The structures on the main canal were completed in February, 1908, and all of the structures for the first unit of 15,000 acres were completed in May, 1908.

FRANNIE CANAL

Some work was done from December, 1907, to March, 1908, on excavation of the Frannie canal, about 3 miles having been completed. The canal was excavated to half section only.

PRINCIPAL CURRENT CONTRACTS

The following table contains data relating to the principal contracts in operation or completed during the fiscal year ending June 30, 1908:

Principal contracts, Shoshone project

No.	Contractor.	Feature.	Estimated value.	Estimated earnings, June 30, 1908.	Completion due—
113	Illinois Steel Co.	Cement.	\$32,579.10	\$26,049.40	Apr. 1, 1907
122	Expanded Metal and Corrugated Bar Co.	Steel bars.	7,060.50	a 7,004.59	Do.
130	United States Fidelity and Guaranty Co.	Shoshone dam.	515,730.00	145,553.12	May 1, 1909
139	Billings Construction Co.	Corbett dam.	66,750.00	71,789.15	Mar. 30, 1908
144	Nels L. Olson.	Garland canal, division 1.	270,746.60	285,817.13	Nov. 30, 1907
148	Jesse W. Crosby, Jr.	Basin, dam, and spillway.	23,740.50	a 22,889.40	June 25, 1907
150	New Jersey Foundry and Machine Co.	High-pressure gates.	54,875.00	35,884.20	Sept. 14, 1908
155	Universal Portland Cement Co.	Cement.	36,615.00	37,305.00	Dec. 31, 1907
156	W. D. Lovell.	Garland canal, division 1, structures.	50,544.00	61,238.84	Feb. 29, 1908
158	Emanuel Thomas.	Garland canal and laterals, division 16.	5,629.00	6,870.90	Apr. 1, 1908
160	Johnson Bros.	Garland canal and laterals, divisions 9, 15, 17, and 19.	78,380.00	84,236.42	Do.
164	Portland Cement Co.	Cement.	4,691.26	4,691.26	June 30, 1908
168	R. M. Lynn.	Garland canal and laterals, division 3.	26,950.00	24,359.08	Apr. 1, 1908
169	McGuffey & Blood.	Garland canal and laterals, division 2.	61,784.00	a 56,030.36	Do.
178	Expanded Metal and Corrugated Bar Co.	Steel bars.	15,056.82	a 5,687.65	Feb. 15, 1908
194	New Jersey Foundry and Machine Co.	Bridge metal work.	1,330.00	a 1,330.00	Oct. 20, 1907
213	Marquette Cement Manufacturing Co.	Cement.	2,533.45	2,533.45	May 1, 1908
220	Do.	do.	5,700.00	1,678.79	.....
230	Portland Cement Co.	do.	11,142.60	1,023.56	Oct. 1, 1908

a Completed.

LANDS OPENED FOR IRRIGATION

On November 25, 1907, approved plats of 4 townships designating about 15,237 acres of land irrigable under the Shoshone project, Wyoming, were forwarded to the Commissioner of the General Land Office with the following public notice:

PUBLIC NOTICE DATED NOVEMBER 25, 1907

In pursuance of the provision of section 4 of the reclamation act of June 17, 1902 (32 Stat. L., 388), notice is hereby given that water will be furnished from the Shoshone project in Wyoming under the provisions of the reclamation act for the irrigation season of 1908, for the irrigable land shown upon farm unit plats of T. 55 N., R. 98 W., Wyoming; T. 55 N., R. 99 W., Wyoming; T. 55 N., R. 100 W., Wyoming*; T. 56 N., R. 98 W., Wyoming; approved September 25, 1907, by the Acting Secretary of the Interior and on file in the local land office at Lander, Wyo.; and that homestead entries, accompanied by applications for water right may be made under the provisions of the said act for the farm units shown on said plats.

The limit of area per entry, representing the acreage which in the opinion of the Secretary of the Interior may be reasonably required for the support of a family on the lands in question, is fixed, for the lands entered, subject to the provisions of the reclamation act, at the amounts shown upon the plats for the several farm units.

The limit for which water-right application may be made for lands in private ownership shall be 160 acres of irrigable land for each landowner.

The charges which shall be made per acre of irrigable land in the said entries, and for lands in private ownership which can be irrigated by the waters from the said irrigation project, are in two parts, as follows:

1. The building of the irrigation system, \$45 per acre of irrigable land, payable in not less than five nor more than ten annual instalments, each not less than \$4.50 per acre.

2. For operation and maintenance, which will, as soon as the data are available, be fixed in proportion to the amount of water used, with a minimum charge per irrigable acre, whether water is used thereon or not. The operation and maintenance charges for the irrigation season of 1908, and until further notice, will be \$1 per acre of irrigable land, whether water is used thereon or not.

The first payment on account of said charges for all irrigable areas shown on these plats must accompany the application for water rights for lands heretofore or hereafter entered, and for lands in private ownership, the total payment being not less than \$5.50 per acre.

The building charge for subsequent years shall be due and payable at the local land office at Lander, Wyo., on or before December 1, and until further notice the operation and maintenance charges of \$1 per acre of irrigable land per annum shall be due and payable at the same time and place. The second installment of the charges shall be due and payable at the local land office on or before December 1, 1908.

For all water-right applications filed in any year on or before June 15, the charges shall be collected for that irrigation season; but when the filing is made subsequent to that date in any year, as much as may be paid on account of operation and maintenance shall be a credit on account of the installment for the next year.

The charges herein provided for may, for the convenience of entrymen, be paid to and received by the special fiscal agent of the Reclamation Service at Cody, Wyo., for transmission to the receiver of the United States land office at Lander on or before the dates specified herein for payments at the local land office.

* On January 4, 1908, approval of farm unit plat for T. 55 N., R. 100 W., was canceled and public notice so modified as to exclude said township from the operation thereof.

INSTRUCTIONS ACCOMPANYING PUBLIC NOTICE

The public notice of November 25, 1907, was accompanied by direction that the local land officers be instructed to give publicity to the notice and to announce that water-right applications must be filed in the proper form in the local land office before water can be furnished; that the United States will operate and maintain the storage and diversion dams and main headworks, the main canals, and main laterals, as shown on a plat of the project approved by the director, a copy of which is on file in the office of the engineer in charge of the project, the cost thereof to be included in the operation and maintenance charges; the necessary sublaterals constituting the rest of the distributing system to be operated and maintained by the water users to be served therefrom at their expense under regulations to be approved by the Secretary of the Interior; that the amount of water to be furnished is 3 acre-feet per acre per annum; that the building charge and number of annual installments are to be stated in the third paragraph of each application; and that the Secretary of the Interior has not entered into a contract with a water users' association under the project, and therefore the certificate of the water users' association forming a part of the application can not now be filled in.

ORDER DATED APRIL 3, 1908

In modification of the public notice issued under the provisions of the reclamation act for the Shoshone project, Wyoming, November 25, 1907, the following is issued:

The payment of the first installment of the building, operation, and maintenance charges for all entries made prior to November 25, 1907, for lands shown by the farm unit plats approved September 25, 1907, and for all such lands in private ownership at that time, shall not be required at the time of filing water-right application. In all such cases the first installment of the charges shall be due and payable on December 1, 1908. In all other respects the said public notice of November 25, 1907, shall be in full force and effect as to such lands.

SETTLEMENT AND DEVELOPMENT

Of the 15,236.68 acres of land opened by the public notice of November 25, 1907, 15,052.89 acres are in public ownership and 183.79 are in private ownership. No water-right applications have been made for the private lands. The public lands are divided into 285 farm units, and 29 water-right applications have been made for such lands, covering 1,548.16 acres.

Most of the lands on the unit now ready for irrigation are very smooth, and but little work is required to prepare them for irrigation. They are very free from brush, and require practically no labor in clearing. All are desert lands with a gravel subsoil. While the season is short, the climate is ordinarily mild and growth is rapid. Should settlement warrant, the second unit of the project, comprising an additional 15,000 acres, can be irrigated during the season of 1909 with but slight additional expense. It will be the policy to extend the works only at such rate as is required by settlement, giving the settlers opportunity to work out their water payments in the construction of the extensions of the canal system. Forty farms, having a total area of 1,500 acres, were being irrigated at the end of the fiscal

year. Homes had been established on all of these, and nearly all were fenced. The settlers come from various points in the middle west. Nearly all are farmers, but few are experienced in irrigation.

OPERATION AND MAINTENANCE

Water was available for use June 1, but very little was used during the month, as the rainfall amounted to 2.36 inches between the 1st and the 23d. Twenty-eight settlers received water.

Very little trouble has been experienced from leaks or breaks in the canal banks. A break occurred at a culvert when the water was first turned into the canal, necessitating a shut down for four days. After Ralston reservoir had been partly filled, a leak developed under the embankment, the water following a ledge of sandstone and eventually reaching the barrel of the outlet culvert. This was stopped by means of an additional cut-off wall extending into the sandstone. Some drainage culverts were washed out by storm waters in June, but they were quickly repaired, and occasioned no delay in the delivery of water. There has been some leakage through the natural gravel beds at several points along the canal, but these have not been serious, and are decreasing. No regular canal riders have been employed to June 30, 1908, owing to the small quantity of water delivered.

IRRIGATION RESULTS

The crops planted have been mostly wheat, oats, alfalfa, potatoes, and other vegetables. All crops were planted late, but most of them are making excellent showings.

FINANCIAL STATUS AND FEATURE COSTS

Assets and liabilities on June 30, 1908

Items.	Debits.	Credits.	Amounts.
ASSETS.			
Accounts receivable:			
Uncollected water right building charges.....	\$3,731.76		\$4,539.04
Uncollected water right operation and maintenance charges.....	807.28		
Inventories:			
Mercantile stores.....	628.09		102,134.37
Government animals.....	12,455.56		
Equipment in use.....	26,952.19		
Storehouse.....	3,462.30		
Cement.....	39,881.97		
Iron and steel.....	1,449.89		
Lumber.....	11,721.29		
Explosives.....	290.37		
Fuel.....	62.35		
Local products.....	2,390.69		
Unadjusted transfers.....	2,839.67		
Cost of work:			
Building cost.....	2,655,505.64		2,651,644.54
Plus adjustments.....	4,593.52		
Less accrued revenues.....		\$1,378.90	
Less accrued repayments.....		7,065.72	
	2,660,089.16	8,444.62	
Operation and maintenance cost.....	5,622.25		4,074.00
Less accrued repayments.....		1,548.16	
	5,622.25	1,548.16	
Total.....			2,762,392.04

Assets and liabilities on June 30, 1908—Continued

Items.	Debits.	Credits.	Amounts.
LIABILITIES.			
Accounts payable:			
Unpaid labor.....		\$4,589.28	\$192,879.90
Unpaid purchases.....		5,446.98	
Unpaid contract estimates.....		31,984.92	
Unpaid contract holdbacks.....		63,225.79	
Unpaid freight and express.....		87,556.98	
Unpaid passenger fares.....		75.95	
Investment of the United States:			
Disbursement vouchers.....		2,576,184.75	2,569,512.14
Collection vouchers.....	\$49,342.90	58,881.23	
Transfer vouchers received.....	15,710.94		
Transfer vouchers issued.....	65,053.84	2,634,565.98	
Total.....			2,762,392.04

Total cost to June 30, 1908, distributed to principal physical features

Shoshone reservoir, lands submerged.....	\$106,460.05
Shoshone dam and spillway.....	253,799.77
Outlet works and gates (earth and concrete).....	75,223.02
Corbett diverting system:	
Corbett dam.....	96,443.61
Corbett tunnel.....	1,097,787.06
Settling basin and spillway.....	23,763.59
Garland canal—	
Earthwork and structures.....	198,670.94
Frannie canal and laterals.....	519,272.43
Willwood diverting system:	
High-line canal.....	18,520.00
Willwood diversion weir.....	225.00
Willwood tunnel.....	811.00
Willwood canal and distribution system.....	8,213.00
Wagon road (canyon).....	51,352.87
Buildings (offices, dormitories, warehouses, etc.).....	31,761.38
Telephone system.....	5,666.23
Irrigable lands (farm units, subdivisions).....	5,064.13
Examination of project as a whole.....	67,863.54
Administration of project as a whole.....	43,841.86
Undistributed amounts chargeable to features.....	49,741.60
Cost ledger inventories.....	1,024.56

Total building cost as per debit in cost of work in statement
of assets and liabilities..... 2,655,505.64

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